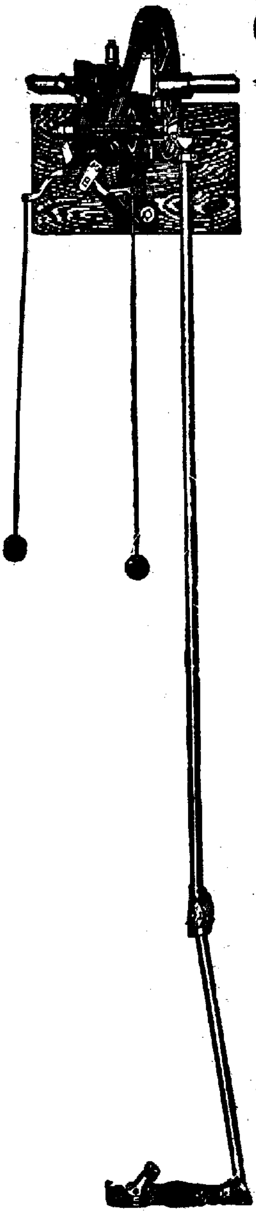

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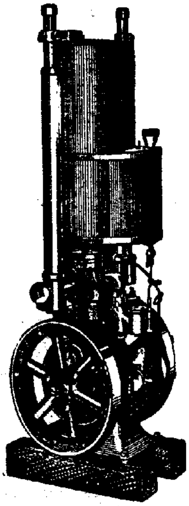

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R. P. BLUNDELL,

Minister of Agriculture.

POINTS FOR PRODUCERS.

Blind Sheep.

The season has again come round when sheepowners are bothered with blind sheep, the affection sometimes being called "pink-eye." A recent note in the *Journal* on the treatment of an injured eye in the horse has explained how the front of the eye is nourished by good blood, and when the nourishment is poor or deficient the scum forms over the eye. The same thing applies to sheep, and when the blood is broken down by parasites, bacteria, sarcosporidia, or worms, any of which may poison it as well, then the damage is proclaimed in the eye. The redness and inflammation around are due to irritation arising from trying to use partially blind eyes, dust, seeds, and such causes. Many varying treatments are prescribed, and a large number recover after their use, and an equally large number recover without their use, and faster than they would had their eyes been irritated by senseless treatment, such as urinating into them, says the Veterinary Lecturer (Mr. F. E. Place, B.Sc., M.R.C.V.S.). Treatment should be systematic, Cooper's tablets will be found of great value. Local treatment can be readily and cheaply applied as a pinch of a powder consisting of carbonate of ammonia one, boric acid 10 parts.

Rust in Hay.

The appearance of rust in various districts foreshadows the usual crop of inquiries as to its value as feed, says the Veterinary Lecturer. It has none, and yet a host of possessors of rusty hay will during the next few months proclaim its value as feed. Horses fed on rusty hay will sometimes do better for a time than they were doing on the old rotten stuff, and a false deduction is made, namely, that rust is good for them. This is not the case. Rust diminishes the feeding value of the grain without increasing that of the hay. The apparent improvement in coat is due to the fact that rust, like all fungi, stimulates the liver to try and eliminate the poisons formed from it. No sheep man would say fluke was good for the sheep, although they lay on fat while the parasites are in an early stage; but like them, the horse feels the after effects, which are far worse than the fleeting good ones. Rusty hay will have to be fed, and it will be well to feed a little molasses with it; the sugar will to a slight extent counteract the bad effects of the fungus.

Sheep for West Coast Farms.

The Director of Agriculture (Professor Arthur J. Perkins) replying to an inquiry from a member of the Goode Branch of the Agricultural Bureau, as to the breeds of sheep likely to prove best suited to that district, stated that in ordinary circumstances, where farms were concerned and where early lambs could be grown and marketed to advantage, he had no hesitation in recommending a long wool Crossbred ewe and one of the Down breeds of rams. He had not the slightest doubt that those types of sheep could thrive in that locality quite as well as on this side of the gulf. On the other hand, it was necessary to bear in mind the fact that they were a distance from freezing chambers, and that fat lambs were likely to suffer a good deal and lose condition should they attempt to convey them from the nearest port to Port Adelaide. In the circumstances, therefore, he did not see that at present they could do much with early lambs, and he thought their requirements would best be met by large-framed, well-bred Merino sheep.

Moving Pictures and Agriculture.

At the recent Canadian National Exhibition, the Ontario Government utilised the moving picture as a means of agricultural education. A continuous display was given, which included scenes showing methods of preventing and combating forest fires, shearing sheep, and handling wool, outward indications of profitable cows, the story of the bacon pig, and other practical topics that interest the welfare of the country. The pictures were thrown on to the screen by means of a small portable machine that could be used in small or large buildings in any part of the country. The motion picture seems destined to play rather an important part, not only from the point of view of agricultural education, but also in research work. Mr. G. A. Coleman has pointed out in the *Journal of Economic Entomology*, that by means of the X-ray and the microscope, in connection with the motion picture camera, the external and internal anatomy of every living thing can be photographed, and all muscular and other movements of animal and plant life can be recorded and reproduced.

THE DANGERS OF GREENFEED.

The very fine growth of greenfeed in the areas adjacent to Quorn constitute one of the most striking features of the North this year, and during a recent visit to the district the Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.) was prompted by the luscious growth of natural pastures to draw attention to some of the dangers of greenfeed.

Speaking at Quorn he congratulated the Branch on the splendid appearance of the country and the amount of feed visible everywhere. He regretted, however, that there was not more livestock to take advantage of it. That being so he said it was necessary to take precautions to prevent the feed doing harm, which generally happened, because many of the plants, such as the King Island melilotus, a sample of which was tabled, produced during rapid growth, or when the seed was forming, substances known as glucosides, which under the action of the stomach broke up into hydrocyanic acid, a substance that was very poisonous indeed; but was only a transition stage before the material became useful food; but on that account it was essential that before animals were turned on to lush greenfeed they should have partly digested material in their stomachs. When that was the case the poisons were not allowed to accumulate, and the food was quickly absorbed. Also, when they went on to green stuff with an empty stomach they would naturally overgorge, and so bring about impaction of the stomach and over distension by the rapidly forming gases. That condition was even more serious in the horse than in cattle, because the inlet and outlet of the horse's stomach were very close together, and distension brought about a physical stoppage. The horse could not relieve himself by eructating; the position of the stomach was such that distension interfered with the action of the diaphragm, and brought about suffocation even if worse things, such as rupture or stoppage of the heart, did not supervene.

As the effects of such distension were exceedingly rapid, treatment must be adopted quickly if to be of any good. The gag recommended for cattle, or the tarred rope, were ineffective in the horse because of the natural form of the lower end of his gullet. But there were many things available on the kitchen shelf that would relieve quickly, among these were a tablespoon of baking soda (or washing soda if the former were not handy) given in half a pint of warm water; a teaspoon of cloudy ammonia, baking ammonia, or sal ammoniac, given in half a pint of cold water; a knob of blue or a teaspoon of mustard or ginger in a little milk; a tablespoon of turpentine in milk or oil; a tablespoon of powdered charcoal in water, or a similar quantity of photographer's hypo. Any of these were generally available, and should be given without delay.

The distension of the bowels had a particularly bad effect on mares in foal, as it was likely to cause displacement of the foal before birth, and so cause a malpresentation. It was particularly necessary to be cautious about putting mares suddenly on to fresh greenfeed, and when it had to be done they should be brought on to it gradually.

The class of plants which were most likely to do harm was the leguminous family, to which belonged the clovers, lucerne, and so on; but as the class contained some of the most valuable fodder plants its use was to be encouraged, and little danger or harm would ensue if reasonable precautions were taken.

INQUIRY DEPARTMENT.

Any questions relating to methods of agriculture, horticulture, viticulture, dairying, &c., diseases of stock and poultry, insect and fungoid pests, the export of produce, and similar subjects, will be referred to the Government experts, and replies will be published in these pages for the benefit of producers generally. The name and address of the inquirer must accompany each question. Inquiries received from the question-boxes established by Branches of the Agricultural Bureau will be similarly dealt with. All correspondence should be addressed to "The Editor, *The Journal of Agriculture*, Adelaide."

[Extraordinary pressure on space has rendered it necessary to very considerably curtail the inquiry department. Replies to those questions of more general interest only have been published; however, every query received has been replied to through the post.—ED.]

VETERINARY INQUIRIES.

"A. H. C.," Coomooroo, asks for treatment for horse with sore shoulders.

Reply.—If the inquirer had been a reader of the *Journal of Agriculture* he would have found full details as to treatment of sore shoulders. When a horse is very susceptible his shoulders should be carefully cleaned every day after and before work. A useful dressing is 2ozs. of white lead in a pint of neatsfoot oil applied to sore and collar before work, middle day, and to sore after work. Great care must be used in having a collar that will fit and keeping it clean. A strip of zinc round the stuffing where the sore is often assists in healing. A main essential is to keep the condition up.

"O'L.," Belalie North, has foal with displacement of hind gut.

Reply—This accident happens through over straining to pass the first dung. This may be avoided by passing a slip of soap smeared with glycerine into the bowel. Hamamelis ointment is a good dressing.

"H. H. P.," Wilkawatt, has calves stiff, giddy, and fall; urine very dark, like blood.

Reply—The trouble is redwater, due to blood cell parasites. Keep bowels well open with molasses and a little Epsom salts and give a tablespoon of syrup of phosphate of iron twice a day till well.

"G. A. Q.," Hildesheim, has a pony mare, 7 years, with swellings on sides of legs.

Reply—The swellings are known as windgalls, and are distensions of the oil sacs sheathing the tendons. Little can be done to those of old standing, and your best plan is to continue using the bandages. You might find improvement by rubbing well each night with an ointment made of one part tr. rhus toxicodendron and 10 parts lard; also by applying cotton wool thickly round the part and bandaging tightly.

"H. W. H.," Parilla, has foal with swelling and discharging after castration.

Reply—Foment swellings well with hot soapy water in which tr. arnica at the rate of an ounce to the quart has been put, open up the holes with the finger smeared with carbolic oil, and encourage discharge. Smear penis well with carbolic oil. Give 10 drops tr. arnica on tongue morning and evening for a few days.

"J. J. K.," Charleston, has cow stiff in joints.

Reply—Names like dry bible, stiff sickness, and so forth, mean very little; but from the symptoms described the cow seems to be suffering from that form of innutrition called stiff sickness in South Africa, and common here. If you can get them give her a bushel of brewer's grains daily for a week or two. Possibly a couple of ounces of syrup of phosphate of iron twice daily would also do her good.

"H. R. S.," Rockleigh, has a mare which keeps head down, walks proppy, lies about, and seems stiff in hind quarters.

Reply—Probably subacute laminitis. Give a teaspoon of Fowler's solution of arsenic three times a day for a fortnight or so, and tie up in a creek for several hours a day, and kindly report progress in about three weeks.

"L. E. C.," Cleve, has a filly lame from lump under knee.

Reply—This is a splint. Either rub it well with a smooth stick for a few minutes daily or apply a series of light blisters, either of which methods will cause its reabsorption.

"H. E. K.," Colton, has a filly with soft swelling under belly.

Reply—Lymphatic. Give a teaspoon of saltpetre in a little bran twice daily for a few days, and apply cooling lotion such as vinegar and water.

Green Patch Agricultural Bureau report that sheep and lambs swelled along belly after shearing, lambs got weak in back and jiggly in hind quarters.

Reply—The trouble was probably a form of blood poisoning known as pasteurellosis. The treatment would be ½-¾oz. photographer's hypo in a little water once a day for a few days. A good number of deaths may be expected. Flies have a part in spreading the disease.

"J. L.," Sandergrove Estate, Strathalbyn, has a horse which holds old coat in patches, lies about, does not roll, penis limp, urine sticky, straddles, and hind legs covered with sticky mess.

Reply—The symptoms point to a collection of sabulous material in the bladder, which could be detected by a veterinary surgeon through the bowel. Possibly an operation may be required, but you may try tr. nux vomica 10 drops morning and evening for a week or so and 20 drops tr. camphor once a day for the same time. I would recommend your having him examined, as it is quite possible that matters have gone too far for treatment to be of much use.

Willowie Agricultural Bureau report a cow with swelling from flank to chest, soft, like wind ball.

Reply—It is difficult to say exactly what is the trouble, puncture it with a bag needle; if wind only comes out it is a rupture, if matter an abscess. In the former case do nothing, and milk may be used; in latter lance and clean, and do not use milk till well. Since the lump appeared all at once it is most probably a rupture, and it will be best to feed the cow off as she dries.

Tantanoola Agricultural Bureau report foal weak on fetlocks and knuckles over, fortnight old.

Reply—Do not destroy, it will probably get all right in a few weeks without treatment. If it does not, rub the fetlocks with one part tr. rhus tox. and 20 parts cod liver oil. This should be done once or twice daily.

"C. R.," Cherry Gardens, seeks information in regard to a horse with greasy heels.

Reply—The tendency to greasy heels may be transmitted by sire and dam; but in the majority of cases it is due to dirt and neglect. The treatment occurs in nearly every number of the *Journal*, which rather points to dirt and neglect being somewhat prevalent in South Australia. Treatment—Mix 1oz. sulphate of zinc and 1oz. sugar of lead in a pint of hot water, and when cool add a pint of methylated spirit. Shake well before use and apply daily to the heels. Give a tablespoon of sulphur in feed once daily for a week.

"W. H. M.," Petersburg, has a horse with lump like egg on side of windpipe.

Reply—The lump is an enlarged thyroid gland, which is of fairly common occurrence; but do not be led into having it cut out or you will soon be able to take the hide off too, as the gland is very necessary for sustenance. The enlargement is not mechanically interfering with the breathing, but the result of interference with nutrition on account of it is the reason. Try rubbing into it once daily a little ointment made of biniodide of mercury 1 dram, prepared lard 2ozs.; this will cause an increased swelling at first, but after a week or two will probably reduce it. I shall be glad to hear in a month or so what progress is being made.

"J. W. & A. C.," Kilkerran, had filly, 4 years, which suddenly went stiff and tenderfooted on a self-sown crop with wild oats. She is very fat.

Reply—The attack is founder or fever in the feet, and it is due to the feed. Give an ounce of Epsom salts in drinking water morning and evening, and 10 drops tr. aconite morning and evening. Let her stand in water over her hoofs for several hours at a time. She will improve, but will probably always be tender in the sole.

AGRICULTURAL AND HORTICULTURAL INQUIRIES.

Murray Bridge Branch of the Agricultural Bureau forwarded specimens of diseased potato leaves. These were referred to the Plant Pathologist (Professor T. G. Osborn, D.Sc.), who reported that in regard to the specimen marked 1 the chief trouble was *Alternaria solani* (early blight). There might be a little Irish blight as well, but not much. In No. 2 the trouble was *Phytophthora infestans* (Irish blight). There was some amount of early blight as well. The treatment in each case was immediate spraying with Bordeaux mixture, 5-5-50 formula. A second spraying might be given in a week or 10 days, and a third if needful.

SALE OF AUSTRALIAN WHEAT.

At the request of the Wheat Advisory Board, the following statement made by the Minister of Agriculture for Victoria (Mr. Hagelthorn) is published:—Melbourne, November 13th.—The Minister for Agriculture (Mr. Hagelthorn) said to-day that as certain statements had been made persistently to the effect that a loss had been sustained by wheatgrowers in connection with the sale of 3,000,000 tons of Australian wheat, it was necessary to explain the exact position. The Imperial Government purchased this wheat at 4s. 9d. a bushel f.o.b. Immediately after the sale had been made it was found that the Argentine had a larger quantity of surplus wheat than was anticipated; and our contract, in whole or in part, could have been cancelled. The scarcity of the shipping became more acute later, and again the sale could have been cancelled. The sale could be cancelled to-day for the same reason. The Imperial Government had paid us £26,000,000 for this wheat and on present appearances there was no prospect of its securing the wheat within a reasonable time. The Imperial authorities had indicated that the wheat it had bought and paid for might be shipped to Canada or America in any quantities for which shipping could be made available; and that whatever price was secured in America our wheatgrowers might have the difference between the 4s. 9d. a bushel and the price realized. Further, we had been allowed to grist every ton of wheat that the Australian flourmills could produce, and this flour would be taken by Great Britain in substitution for wheat. The British Government had agreed to pay for the storages that had been and were being erected to store this flour. It was hardly possible to conceive of more generous or more magnanimous treatment at the hands of those who were fighting our battles and the battle of the world's freedom. It was not true, added Mr. Hagelthorn, that large quantities of additional shipping could have been secured for the transport of the wheat. The Imperial Government had agreed to pay about £800,000 a year to have the wheat looked after.

THE GENERAL MANAGEMENT AND BREEDING OF PIGS.

[An address delivered at the Annual Agricultural Bureau Congress by W. J. Colebatch, B.Sc. (Agric.), M.R.C.V.S., Principal Agricultural College, Roseworthy.]

At the present time we are confronted with unprecedented conditions regarding our meat supplies. It is stated that there are several million carcasses in cold store in Australasia to-day, and in the face of the shipping difficulties, and the probability of another good grazing and cropping season ahead of us, it is appropriate that this congress of farmers should give its earnest attention to the question of stock raising, and in particular to the position of the South Australian farmer in relation to meat production as a means of furthering the interests of the Allied Nations during this great war, and ultimately of providing against the lean years that may be expected to follow closely in its wake.

At first glance it may appear to be economically unsound to expand in the direction of increased meat production at the present juncture, for with the large reserves already on hand, and the great dearth of shipping, the requirements of the local markets should be amply provided for, and consequently the effect of largely augmenting the supplies may be expected to have a depressing rather than an appreciating influence upon values. To grasp the situation fully, however, it is necessary to take a broader view of the matter than this. In the first place, we must recognise that the interests of the British Empire are those of Australia, and our responsibilities will not have been fully shouldered until we have strained our resources as a food-producing nation to the very utmost. There is, I feel confident, no justification for the fear that increased production of meat will be rewarded by unprofitable prices. The heaping up of vast quantities of surplus grain has not been allowed to imperil the interests of the Australian wheatgrower; indeed, the farming community has been encouraged by Government guarantee to go on producing wheat to the limits of its powers. True, there is a vital distinction between meat and wheat in the matter of storage, and the time may even come when, through lack of cold storage accommodation, the local values of livestock may be forced down to pre-war rates, or even lower; but so far, at any rate, there has been no suggestion on the part of the authorities that this critical stage is being closely approached, and the high market rates obtaining certainly lend no support to this view. The ruling rates for porkers and baconers have certainly receded slightly from the abnormally high values of the past two years; but having regard to the price of pig foods, the margin of profit is still a relatively wide one, and, moreover, the fluctuations of the pig market, even in times of peace, are so frequent and abrupt that anyone who enters upon pig farming without taking them into consideration can only be regarded as lacking in gumption. No doubt the uncertainty of the market has in the past been the chief obstacle in the way of an extension of the practice of pig farming in this State, and with a view of steadying prices it has been proposed by the Director of Agriculture that, when the time is opportune, an oversea trade shall be established, so that the farmers of this State may secure a share of the 25 millions sterling paid by Great Britain every year for a wholly inadequate supply of imported pig products. Simultaneously the effect of such action would be to obviate in a large measure the swamping of the ocal market, and to bring within reasonable limits the range of variaion in prices. Even in countries like Great Britain, where the local roduction falls far below the demand, we find that the pig market s subject to greater fluctuations than are met with at sheep or cattle airs, and it has been noticed that the prices show a series of waves, the rests of which are separated from one another by a period of four to ive years. There are many factors contributing to this peculiar want f stability in values, and it will be to our advantage to examine them losely.

1. The attractiveness of the business, from a speculative standpoint, when prices are high, is so obvious that there is a tendency for men to lose their heads and rush headlong into the business without proper consideration. When weaners of 20lbs. to 30lbs. each can be disposed of at from 15s. to £1 apiece, any good sow can be relied upon to return from £10 to £12 a year, which is far in excess of the average return per head obtained from the milking cattle of this State, and the cost of production will be very much less. On these figures, and they are by no means an exaggeration of the possibilities of the industry when the market is inflated, as it has been for the last two years, at least, the keeping of pigs is properly regarded as a very lucrative business, and many who are lacking in knowledge and wholly deficient in experience, hasten to participate in the richness of the market, only to find that by the time they have pigs to sell, the wave has broken, and left them floundering in a sea of unprofitable prices. The usual sequel is an equally wild stampede in the opposite direction. All the speculators who have bought experience in this way seek to end their troubles by sacrificing their breeding stock in a broken market, and by so doing, help to depress prices still further The moral to be drawn from this too frequent display of faulty judgment is that he

who dabbles in pig farming for purely speculative reasons must eventually get his fingers burnt; whereas he who ignores, to a large extent, the vagaries of the market, but goes steadily on carrying his breeding stock through the periods of depression, even though it be at a loss, will surely come out on the right side. He will always be in a position to take immediate advantage of high prices whenever they recur, and his profits thus realised will compensate him for his losses and leave him a good balance in hand.

2. The small amount of capital involved in the purchase of foundation stock, and the insignificant outlay required for yards and huts, combine to bring pig raising within the reach of almost every landholder, and thus pave the way for the ready establishment and dispersal of short-lived herds in accordance with the caprice of the markets. Similarly, the cost of pig foods, which is largely dependent upon the success of the season's cropping operations, helps to determine the profits, and so exerts a steadying or an agitating influence upon prices, as the case may be.

3. Other important factors in this connection are the fecundity of the sow, and the remarkable aptitude to fatten which has been developed in the modern strains of pigs. Later on the question of prolificacy in sows will be further considered, but for the present it will suffice to observe that on the average sows will present their owners with 12 to 14 piglings a year, and since, under the present-day system of management, pigs are marketed when from six months to nine months old, instead of at about double that age as in years gone by, it is not difficult to understand that in a limited market the influx of even a moderate number of fresh suppliers will soon reveal itself in the increased yardings at the regular sales. The improved methods of feeding now in vogue have materially helped to shorten the time occupied in fattening-off pigs for market. Whilst recognising that these characteristics are contributory in no small degree to the variable state of the pig market, it must be admitted that they are amongst the most valuable features of well-bred pigs, as it is obvious that the more pigs a farmer can dispose of from his brood sows in a given time, and at satisfactory figures, the better will be his balance-sheet. Hence it is essential that any measures proposed for imparting equilibrium to the local pig market must give full cognisance to these attributes and their undoubted influence on the sudden and extreme variations in the number of pigs available from time to time.

4. In addition to the foregoing influences, we have to consider the changing character of the market itself, as indicated by the demands of the butchers, and the prices they are prepared to pay when supplies

are short. Under Australian conditions, where the spending powers of the people are relatively high, practically every member of the community is in a position to indulge his tastes without regard to market values, and in consequence the rise and fall of prices is not greatly affected by modifications in the economic circumstances of the general public. Formerly this was not so, nor is it the case to-day in most other countries where lower wages obtain. There the tastes of the public are governed by their means to a much greater extent, and hence, when taxation is high, or when other factors intervene to depress the net earnings of the community, the demand for pork and bacon becomes easier, and prices must inevitably fall to a level that will bring the commodity within reach again. Closely related to the prosperity of the people is the cognate question of the general state of trade locally and in other parts of the world. Whenever oversea trade is established, there is immediately introduced an external influence on market values, the force of which is determined by the efficiency of the transport service, the margin of profits available to exporters, the relative values in the countries concerned, and the extent to which the laws of supply and demand are allowed free play. When the sea-borne trade is restored at the conclusion of the war, and we are in a position to export our surplus pig products regularly to other portions of the Empire, we shall find that the disturbance in local values induced by differences in the prosperity of the two countries concerned will be relatively unimportant as compared with the regulating effect consequent upon the establishment of an outlet for an almost unlimited surplus.

On general grounds it may be said that farming operations cannot be expected to result in the rapid accumulation of big profits relatively to other business enterprises, as the capital invested is not turned over sufficiently often, and it will be freely admitted by men in the trade that he who expects to hastily gather a competency through pig farming is doomed to disappointment. There is, however, much to be said in favor of pig farming as an adjunct to other farming operations, and it is in this direction that I hope to see it extend in the near future. The gradual transition from large to small and still smaller holdings which is in progress in Australia to-day, and which will ultimately compel us to readjust our views on the relative merits of the different systems of farming, is indicative of the fact that the agriculturists of this State are beginning to assign a proper value to intensive cultivation and stock raising. The settlements along the Murray, the formation of soldier settlements, and the vast possibilities of the South-Eastern district, have given us a wider conception of the word "farming," and I entertain the belief that a very large number of those who settle on these limited holdings, and who must look to livestock as one of their chief sources of income, will soon discover the wisdom of making pig raising one of their chief industries. It should also be stated that although pig farming is very commonly associated with dairying, to the economic advantage of both, yet it is not by any means essential that dairy byproducts should be available even where breeding stock are kept. In actual fact, there is really no justification for the exclusion of pigs from any holdings that can be made to grow wheat successfully, and, no doubt, when trade relations have been established, and a more reliable market secured, we shall find pigs growing steadily in favor throughout the farming districts of the State.

SYSTEMS OF PIG FARMING.

The pig may be turned into profit under several different systems of management, and pig raisers quickly adapt their practices to suit the character of the market. Thus we find breeders of stud pigs, who dispose of their stock chiefly as weaners or at a breeding age, particularly young sows in pig; we have also breeders of herd pigs, who sell off the bulk of their surplus as slips ready for fattening; and, in addition, we have the pig fattener, who keeps no breeding stock, but depends for his profit upon the ratio of prices as between stores and fats. More generally, however, one man practises all these different methods as the changing nature of the market demands, due consideration being given to the fact that the cost of each pound of increase advances progressively with the age of the animal.

OLD AND MODERN SYSTEMS.

In order to be a success, any commercial system must be moulded to suit the tastes of the community that supports it. Doubtless the persistence of the old system of keeping pigs in store condition for a year or more before placing them into the fattening pens was due in no small degree to this fact. Even to-day there are places where public preference is still shown for the strongly cured fat bacon that has become a comparatively rare commodity on most markets, and hence the pig raisers that supply these localities are still compelled to follow in a modified form the practices of their forefathers. Briefly, their plan was to turn the weaners out into yards, or sometimes into grazing fields, for 12 months or 15 months, to develop a frame expansive enough to enable them to carry a carcass scaling 300lbs. or 400lbs. live weight. They drew a clearly defined line between the growing and fattening periods, and aimed at marketing their heavyweights at about 18 months to 20 months old. During the period of growth they were kept on the lowest ration compatible with the object in view, in order to reduce the cost of production to a minimum. In effect, throughout the interregnum between weaning and fattening they were maintained in ordinary store condition, and under the conditions then existent it is probable that this was the most economical policy to pursue.

In those days the meat markets were very much understocked, and the volume of oversea trade was very small, so that quality was relatively of little importance as compared with the necessity for keeping up supplies. Again, the value of cereal offals and other suitable pig foods was so high as to prohibit the use of all but the most inferior samples for the production of pork and bacon, which were relatively low in value. Moreover, the system of mild curing was then unknown. Bacon was only manufactured in the winter, and since it had to be preserved right through the year, without resort to cold storage, a much larger amount of salt had to be incorporated with it than under the mild curing system, the product of which is usually consumed before it is many weeks old. Now, if the strong curing methods were applied to carcasses carrying a high proportion of lean meat to fat, the result would be a hard, unsavory, and indigestible bacon, that would be difficult to dispose of even amongst a population toiling heavily under rigorous climatic conditions; hence the bacon curers of the past were doubtless wise in placing a premium on the heavy, fat-laden carcass that could be relied upon to yield a minimum of lean meat, and the pig raisers were likewise justified in the methods they adopted, as the type of carcass demanded of them could only be secured from the relatively slow-fattening strains then available by allowing sufficient time for the development of an ample frame and hardy digestive organs. The conditions of 30 years to 50 years ago, however, are almost totally dissimilar from those existing to-day. Various circumstances have assisted to bring about drastic changes in the public taste, in the methods adopted by the primary producer, and in the system of bacon curing and storing. There is an almost universal demand to-day for small joints cut from young rapidly maturing animals, and characterised by abundance of lean meat of mild appetising flavor. The increased earnings of the people have not only led to a greater consumption per head, but have also increased the demand for high-grade products. Coincident with this change came the discovery of mild curing and cold storage, and an improvement in the capacity of pigs to grow and fatten simultaneously when properly fed. The store period in the life history of the pig has been abolished as an essential to success—indeed, it is obvious that the requirements of the present-day market could never be met on the old system. Even young breeding stock are kept in half-fat condition whilst their systems are being developed, and where heavyweights are still favored, time and food are economised as far as possible by keeping the fattening process going throughout the period of growth. Under the modern system the most popular bacon pig in Australia and over the greater part of Great Britain is a prime light baconer going about 200lbs. live weight when seven months to eight months old. This will give from 150lbs. to 155lbs. dressed carcass, and the sides of bacon will scale from 50lbs. to 60lbs. each. To secure top prices bacon pigs should be long and deep from shoulder to hip, thick in the flank, well developed in the hindquarters, and relatively light in the shoulder and forequarters. Fine skin, bone, and hair are valuable as indicating quality in the meat.

The most valuable part is the middle; next comes the hindquarter, and then the forequarter and head, the fore end being worth only about half as much per pound as the sides.

Porkers are less sought after in Australia than in colder climates, where large joints and fat pork are appreciated. In London and in the warmer countries light porkers dressing 60lbs. to 80lbs. are preferred; but where the weather is more extreme, heavier pigs up to light bacon weights are used for pork. The pork market is generally supplied from piggeries worked in conjunction with dairying, the feeding of separated milk, buttermilk, or even whey being of great advantage where pigs are to be marketed before they are six months old. The small, compact pig, that matures and fattens very rapidly, is the best for this trade, a cross between the Middle Yorkshire and Berkshire breeds being admirably suited to the purpose.

GENERAL MANAGEMENT OF SOW.

The sow requires less control than most breeding animals, which is a very fortunate circumstance, as there are few animals in this world less appreciative of interference than a farm sow.

From the time she first goes to the boar till her breeding days are over she is regarded simply as a reproductive machine which must be maintained in moderate flesh only, so that she may perform her stud duties the more thoroughly. Her life may be divided into three periods, namely:—(1) Mating period. (2) Period of gestation. (3) Farrowing and suckling period.

Normally these periods will occupy from six to seven months, so that when all goes well she is able to complete the busy cycle twice every year, and at the end of her period of usefulness as a breeder she is hastened into the fattening pens and ultimately sold off as a "back fatter," to meet the demands of the manufacturer of sausages and pork pies.

With the exception of the first few months of adolescence the farm sow is allowed no respite from duty unless Nature intervenes, and if the interruption be at all protracted she is in imminent danger of being fattened for slaughter. Practically, then, the art of controlling sows resolves itself into the problem of how to stimulate to the fullest extent their procreative and maternal functions without injury to the constitution and general health.

MATING PERIOD.

We will consider first the young sow from the time she is weaned, till she is pregnant with her first litter. Owing to their sexual precocity young sows should be separated from boar pigs, at not more than three months old, and during the growing period that ensues before they are required to breed, they must be given every opportunity of developing a wide-sprung frame and roomy carcass.

(a) *Age to Start Breeding.*

Various opinions are held as to the correct age at which to mate maiden sows. They are usually forced along with abundance of nourishing food, and consequently the sexual system develops rapidly. As a result, young sows may evince systems of heat at three months, but care should be taken not to breed them at that age. Even at six months they are not sufficiently advanced to be mated with safety, nor is it economical to allow them to reproduce at this age. When they are kept in market condition from birth onwards, they may be put to the boar earlier than when they are allowed to grow and develop their frames under more natural conditions.

Breeding too young, however, results in small weakly litters, and the act of giving birth is liable to be a difficult and dangerous process. It is said that by mating early time is saved, but this is not so, as the development of the young mother's frame is interfered with, and she is less capable of producing profitable litters during her best breeding period than she would otherwise be.

The immediate advantages of early litters are insignificant in comparison with the repeated losses sustained during the remainder of the sow's breeding career through overtaxing the young system.

There are, however, equally cogent reasons for avoiding the mistake of breeding too late. Young sows are particularly good doers, and if their fattening propensities are not checked, they speedily become too high in condition for breeding animals. They not only lay on fat externally, but their breeding organs lose tone, and it becomes a difficult matter to get them in pig. They frequently produce small and unprofitable litters, and as a rule their maternal instincts are less acute than is the case with those that have not suffered a check to their breeding powers.

Whilst recognising that unusually precocious sows, and likewise those that are backward in development, will form exceptions to the general rule, it may be said that under our conditions the best results will be obtained when sows are allowed to throw their first litters at 12 to 15 months old.

(*b*) *Most Profitable Portion of Breeding Period.*

In pigs the capacity to produce large weighty litters does not appear to be fully developed till the breeding organs have been in use for some considerable time. Interesting figures bearing upon this question are shown below:—

TABLE I.—*Showing Size of Litters and Weights of Piglets Obtained from Sows of Different Ages.*

WISCONSIN.

Age of Sow.	Number of Pigs per Litter.	Average Weight per Pig at Farrowing. lbs.
1 year	7.8	1.8
2 to 3 years	7.5	2.6
4 to 5 years	9.0	2.9

IOWA.

Age of Sow.	No. of Pigs per Litter.	Average Weight per Pig at Farrowing. lbs.	Average Daily Gain. per Pig at Six Weeks Old. lbs.
1 year	7.66	2.39	.32
2 to 2½ years	9.60	2.63	.40
Aged	10.60	2.61	—

ROSEWORTHY COLLEGE.

Age of Sow.	Average No. of Pigs per Litter.	Average Live Weight per Pig at 2 Months. lbs.
1 year	5.8	27.4
2 to 3 years	7.3	33.7
Aged	7.7	39.0

It is clear from the foregoing results that the older sows produce more pigs, and their progeny are better developed at the time of birth than the progeny of the younger ones. There is an indication, also, in Iowa table that the nursing qualities improve with age, and a similar deduction may be made from the weighings at weaning time recorded at Roseworthy College.

In commenting on the Wisconsin figures, the experimenters conclude, "that the common practice of many farmers in disposing of their old brood sows each year, and reserving immature animals for breeding purposes is not to be commended. Our farrowing records for several years, where each litter was weighed at birth, as well as the practices of leading breeders, bear out the statement that sows from three to five, and even six years of age, are much more profitable and satisfactory as breeders than sows one and two years old.''

(c) *Duration of Breeding Period.*

In a feral state, sows are said to produce two litters a year until they are from 15 to 30 years of age, but it is not usual to find sows over seven or eight years of age in domesticated herds. True there are instances reported in which sows have been kept till they have attained 15, 19, and even 32 years, and in stud pig breeding it is often desirable for special reasons to go on breeding from sows long after they are past their prime, but in ordinary circumstances the profitable breeding period will generally be limited to six or seven years at the most. If a sow be a reliable breeder, and if she is safe in the sense that she can be trusted to rear the litter without causing undue loss by clumsiness and bad temper it is clear from what has already been said that within reasonable limits age should count in her favor rather than against her.

In the experience of most practical men, however, brood sows tend to become more and more vicious with advancing years, and hence by reason of their own ill-temper, they themselves determine the duration of their profitable breeding period.

(d) *Mating.*

Sows may be brought to the boar and mated in a sty or small yard, or they may be allowed to run with the boar in an open field from the time they are weaned till they are heavy in pig. Where only one or two sows are kept, the former method is usually followed, but with larger herds there are very many reasons in favor of the paddock system. Amongst the alleged disadvantages of the latter may be noted:—

(1) The possibility of accidents to boar or sows. In the sty system the pigs are more under the herdsman's eye, and losses through injury or ill-health will be promptly detected, whereas in the field, accidents of this kind may escape attention, and the regular throw of litters may be somewhat seriously disturbed.

(2) It is said that boars running at large are inclined to become savage, but I cannot subscribe to this view, as the College herd has been worked on this system for many years, and in my experience the closely-penned hog is far more apt to develop a vicious temper and become difficult to control than one kept under more natural conditions.

(3) Again, the vigor and potency of the boar is said to deteriorate when he is allowed unrestricted services, and the sows are said to be injured by too frequent mating. The litters, also, are held to be small in number and inferior in quality.

It may seem at first sight that these views are well founded, and probably correct. We know that sows remain "in season" for two to three days, and that the oestral cycle is from a fortnight to a month in duration. It is a reasonable supposition, therefore, that by permitting unlimited services, where the number of sows in the field ranges from 10 to 20, there is a danger of the generative glands being drained to such an extent that the boar's fertility is seriously, if not permanently impaired. We further know, however, that young boars less than a year old may safely and effectively cover three sows per day, whilst two-year-old boars will, without detriment, fecundate five or six sows in the 24 hours, provided intervals of two to three hours are allowed between the services to permit of the recharging of the receptacles in which the "seed" is stored.

Although it is usual to allow about 50 sows a year to a mature boar, and half that number to young ones, it is well known that a healthy, full-grown hog is capable of impregnating 150 or more sows per annum. We see, therefore, that the essential reproductive organs of the hog are capable of meeting heavy demands, and I very much doubt whether they are ever overtaxed when the sexes are associated in open fields and full liberty is granted.

The continuous close-penning of boars, on the other hand, is an unnatural system, and far more conducive to impotence. The boar is naturally a very active animal, and when confined in a small sty he is forced to lead an inert and monotonous existence, and hence lose his vigor through ill-health and over-loading of the system with adipose tissue.

In our experience—and we have given both methods extensive trial—the more natural method of allowing the boar and sows freedom and liberty, results in the throwing of the healthiest and most profitable litters. In addition, it maintains the dry sows in the best of health at a minimum cost and reduces the labor round the piggeries to the lowest possible figure. It must be emphasized, however, that the system in no way diminishes the need for close supervision, but on the contrary, unless the owner keeps an observant eye directed towards the mating field, the results may be both disappointing and costly.

PERIOD OF GESTATION.

(a) Signs of Pregnancy.

There is no means of determining at once whether mating has been followed by conception, but there are certain well-known symptoms that enable a decision to be arrived at in normal cases at the end of the third week.

Sows in good health exhibit signs of "heat" every 21 days when not in pig, but throughout gestation there is usually—though not invariably—an entire absence of the changes indicative of rutting, and, moreover, there is normally a decided aversion to the companionship and advances of the boar. It occasionally happens that a sow will continue to come in season after she has conceived, and may even accept service, sometimes with disastrous results.

In addition to this negative evidence, there are other important subjective signs, some of which may be noticeable almost immediately after fecundation. There is frequently observed a radical change in temperament and behavior; vicious and even dangerous sows will become placid and docile under the influence of approaching motherhood; restless and lively sows become quieter in their habits, slower and more sluggish in their movements, and tend to lie down more and more as farrowing draws near.

This tendency to become more restful and quiet is accompanied by an improvement in condition, due in part, no doubt, to the reduction in activity, but more particularly to the stimulating influence of pregnancy on the whole system, which is reflected in the increased tendency to fatten. At the latter end of pregnancy, however, when the udder begins to show signs of active development, sows usually go off a little in condition.

By the seventh or eighth week there will be no difficulty, as a rule, in determining the result of the mating, for not only will there be visible unmistakable signs, such as the enlargement of the belly and the swelling of the milk glands, but it will generally be possible at this stage to feel the young through the abdominal wall, and thus disperse all lingering doubts.

(b) Signs of Farrowing.

From two to three weeks prior to the due date, other changes become visible, and it is upon these that we have to depend very often for information as to the probable time of farrowing. As the management of the sow from this time onward is of the highest importance, and since it is not always possible to record the date of service, it is very desirable that the full significance of these late symptoms should be realised. One of the chief signs of approaching birth is the swelling of the teats and milk glands. The latter become reddish and engorged, and about 12 to 15 days before farrowing they begin to secrete milk. In animals carrying their first litter the enlargement of the mammary gland occurs early in pregnancy, but in those that have bred several litters it only becomes noticeable during the last stages, the appearance of milk in the teats being interpreted to mean that farrowing will occur within 24 hours.

(c) Duration of Pregnancy.

In conformity with the general law that multiparous animals, that is those that produce several young at a birth, endure shorter periods of gestation than those that normally produce a single young one at each parturition, we find that in sows the interval that elapses between impregnation and birth is usually rather less than four calendar months.

The duration of this period is subject to variations according to the breed, the rate of development, the age and general condition. The more improved, rapidly maturing breeds, like the small Yorkshire or Essex pigs, undergo a shorter pregnancy than the larger and coarser types. Old sows, sows that have been improperly fed and allowed to get too low in condition, and young sows carrying their first litter, do not as a general rule retain their young the full period, but may be expected to farrow any time after the fifteenth week.

What may be termed the normal period for mature sows in good breeding condition is 16 weeks, or 112 days, but strong, vigorous, robust mothers will frequently go the full "three months, three weeks, and three days," or, in rare instances, as long as 18 weeks before littering.

These special points should not be lost sight of, but for general purposes a gestation table worked out on the basis of 112 days is found to be sufficiently accurate.

(d) Management During Pregnancy.

Sows in pig require a minimum of attention during the early stages of gestation. By preference, all dry sows should be turned out to graze. They should be kept in good thrifty condition, the extremes of obesity and poverty being carefully avoided.

If sows are allowed to lay on too much condition during pregnancy their maternal instincts are dulled out, and they fail to nourish their young properly. In addition they show less interest in the welfare of their offspring, and are more prone to injure and destroy them by clumsiness and indifference to their whereabouts. It should be observed, however, that sows that are enabled to take as much exercise as they require will produce and mother profitable litters whilst carrying much more condition than would be permissible where the yarding accommodation is strictly limited.

Underfeeding of sows whilst carrying a litter leads to the casting of ill-nourished, weakly youngsters, and an inadequate supply of mothers' milk, the loss of which it is almost impossible to repair. Furthermore, the evil effects of such neglect will almost certainly be felt after the litter has been weaned, as the nursing period will probably have reduced the sow to such a state that she will either have to be rested before going back to the boar, or else require to be specially well fed during her next pregnancy in order to secure a satisfactory litter.

Beyond regulating their condition, providing plenty of shelter and clean drinking water, no other treatment is necessary until the sow begins to "spring." This will be about a fortnight before farrowing, and she should be then placed in a proper farrowing pen fitted with a protecting rail and connected with a small yard for exercise. If given a supply of fairly short straw, she will make a nest in which to keep her offspring warm, but the amount provided should not be excessive, otherwise losses occur through the young ones becoming buried and accidentally killed.

FARROWING AND NURSING PERIOD.

The pig is easily the most prolific animal on the farm. In a wild state sows produce about five pigs at a time, but under the influence of domestication and selection their prolificacy has been considerably increased.

(a) Size and Frequency of Litters.

As many as 24 pigs have been produced at one farrowing, and there are many instances recorded of litters ranging from 16 to 20. Having regard to the wonderful reproductive capacity of the sow, and also to the brief interval between mating and weaning, the procreative possibilities of pigs are truly enormous. For instance, it is recorded by Coburn that a sow produced five litters averaging over 15 pigs per litter in a little over two years; another yielded 45 pigs in less than 12 months; whilst a third one is said to have given birth to 48 living pigs between April 12th, 1907, and April 15th, 1908. These examples, however, of the remarkable fecundity of the sow are not quoted as standards to which pig breeders should aspire, but they serve to indicate the type of evidence upon which have been based many fallacious and amusing calculations, concerning the money-making potentialities of the domesticated hog.

Under ordinary farm conditions, a good breeding sow may be expected to average from six pigs to 12 pigs each farrowing, and to produce a litter every six months to eight months, if all goes well.

Where a limited number of sows is kept, as will be the case on most farms, it is possible to give very close attention to each individual in the herd, and thus to eliminate losses that are unavoidable in large herds; but even so, if due allowance be made for deaths, mishaps, and accidents, it will generally be conceded by those experienced in pig raising that a sow which brings regularly to the weaning stage an even litter of seven vigorous, well-furnished suckers is doing all that should be expected of her, and will probably prove to be more profitable to her owner than those that are more fruitful, yet deficient in the qualities of motherhood.

At the College we frequently obtain litters of 12 or more, but our average for the whole herd is 7.5 per sow. This is lower than it would be if we were engaged in commercial pig farming, instead of stud breeding, for we have at times to retain the services of certain of our sows for much longer periods than we would be justified in doing if the number of progeny was the sole consideration. If we assume, then, that a good sow returns to her owner seven weaners every seven months, and I am convinced that those who figure on higher average yields are doomed to disappointment sooner or later, we obtain an average annual yield of 12 pigs, which will scale at weaning from 30lbs. to 35lbs. weight each. If these were all disposed of as weaners at, say, 6d. per lb., each sow would give a gross return of from £10 per annum.

(To be continued.)

INTERSTATE CONFERENCE OF AGRICULTURAL SCIENTISTS.

AN IMPORTANT GATHERING.

A Conference attended by agricultural scientists from all the States, convened by the Federal Government at the instance of the Advisory Council of Science and Industry, was held in Melbourne from November 9th to November 16th, 1917. Professor A. J. Perkins (Director of Agriculture of South Australia) presided. A number of papers dealing with different aspects of agricultural science were read before the conference and valuable discussions took place on each subject. The papers with a summary of the discussions will shortly be published by the Advisory Council. The topics dealt with were as follows:—Wheat-breeding (introduced by H. Pye, Victoria); Oats and Barley-breeding (J. T. Pridham, New South Wales); Maize-breeding (H. Wenholz, New South Wales); Statistical Methods applied to

Plant-breeding (Dr. W. H. Green, Victoria); Production of Cereals for Arid Districts (A. E. V. Richardson, Victoria); Immunity and Inheritance (D. McAlpine, Victoria); Plant Acclimatisation (G. L. Sutton, Western Australia); Utilisation of Australian Phosphate Deposits (Professor J. W. Paterson, Western Australia); Tobacco Culture (T. A. J. Smith, Victoria); Utilisation of Native Grasses and Fodder Plants (E. Breakwell, New South Wales); Fibre Crops (T. Hogg, Victoria); Sugar Crops (H. T. Easterby, Queensland); Crops for Production of Power Alcohol (W. R. Grimwade, Victoria); Suggestions as to Commonwealth Endowment of Agricultural Research (Professor A. J. Perkins, South Australia); Agricultural Research and Co-ordination of Effort (Professor R. D. Watt, New South Wales).

The following resolutions were carried by the Conference and have been forwarded to the Executive Committee of the Commonwealth Advisory Council of Science and Industry:—

1. This Conference recommends to the Executive Committee of the Advisory Council that a "Seed Improvement Committee" be formed under the Council. This Committee should, among other matters, deal with (*a*) The nomenclature of cultivated varieties of farm crops. (*b*) The elimination of undesirable varieties of crops. (*c*) The exchange and dissemination of seed samples for research work. (*d*) The recommendation of money grants to approved State or other Institutions for work in connection with seed improvement and the introduction of improved varieties of crops.

2. That in view of the benefits to be derived from the systematic introduction of seeds and plants into the Commonwealth and to ensure more economy of effort in this direction on the part of all the States, this Conference is of the opinion that as soon as practicable a Plant Introduction Bureau should be established, the functions of which would include—(1) Arrangements for the introduction of new and useful agricultural plants from other countries into the Commonwealth. (2) The systematic testing of these introduced plants in co-operation with State Experiment Farms. (3) The systematic recording of the results of such tests.

3. That this Conference recommends that each State Department of Agriculture should continue or initiate the work of improvement and selection of its cultivated crops as part of its regular work, and that such work of improvement be on uniform lines in all the States.

4. That the rust in cereals, particularly black rust in wheat, which is common in all the States, and in some seasons largely reduces the yields, be made the subject of a special investigation in connection with plant-breeding.

5. That the Executive Committee of the Advisory Council be asked to arrange for an annual meeting of plant-breeders from the different States, with a view to co-ordinating their work and arriving at a uniform policy without interfering with individual methods. The meeting to be fixed at a convenient season of the year (July).

6. That this Conference recommends the establishment of an organisation to deal with the collection, propagation, improvement, and cultivation in suitable areas of the most promising indigenous grasses and fodder plants.

7. That this Conference recommends to the Advisory Council of Science and Industry the advisability of closely investigating the tobacco industry in Australia, both in the interests of the producer and with a view to retaining locally the profits of manufacture.

8. That in view of the high prices ruling for fibre products and the desirability of making Australia self-contained in the production of fibre, the Conference recommends the Advisory Council of Science and Industry to make a thorough investigation into the possibilities of fibre cultivation in Australia, particularly flax and sisal hemp, and the possibilities of producing these fibres for local manufacture or for export.

9. That the Advisory Council of Science and Industry be asked to ascertain whether the British Government would be prepared to purchase dew-retted flax fibre from Australia in 1919, and if so, what quantities and at what price f.o.b.

10. The Conference is of opinion that the prospect of commercial production of power alcohol from certain crops is promising, and suggests that special experiments should be arranged by the Advisory Council of Science and Industry to determine the actual yields of alcohol obtainable from these crops, including sorghums in various stages of development.

11. That this Conference welcomes the proposal of the Advisory Council to investigate the utilisation of Australian phosphates, and suggests that this investigation should include manurial trials, particularly on pasture lands in those of the States which possess such phosphates.

12. That in view of the need for a supply of scientific investigators into agricultural and pastoral problems the Advisory Council of Science and Industry be requested to direct the attention of the various Australian Universities to the subject.

13. In view of the prominent position occupied by the United States of America in scientific and practical agriculture, and of the similarity of the climatic and economic conditions of that country to those of Australia, this Conference recommends the early appointment of a permanent agricultural representative from Australia to the United States, whose duties should include keeping Australia in touch with improved scientific and practical methods in agriculture and the supply of promising varieties of cereals and other crops.

14. That this Conference expresses its appreciation of the action of the Executive Committee of the Advisory Council of Science and Industry in calling it together, and is confident that the opportunity of meeting and consulting together thus afforded to agricultural scientists from the different States will be beneficial to agricultural progress in Australia.

ENSILAGE.

ITS MANUFACTURE AND USE.

[An address delivered by Mr. W. J. SPAFFORD (Superintendent of Experiments) before the Pompoota Branch of the Agricultural Bureau.]

The present meaning of the word "ensilage" is green forage stored in a green succulent condition. It is by no means a new art to manufacture ensilage successfully, in fact it is very old, but was revived towards the end of the last century, and was then boomed and made very rapid strides, mainly through the United States of America taking it up seriously, after the appearance in that country in 1879 of the translation of a work on the subject written by M. Auguste Goffart in 1873, and of the "Book of Ensilage," by Dr. J. M. Bailey, of Boston, in 1880. Its manufacture made such rapid progress that in a very short time after the publication of the above works, a conference of several hundreds of farmers was held in New York to compare their experiences of the fodder. That it is only the revival of an old art there is no doubt, because the ancient Romans left references to the storing of green fodder in underground chambers, and the Mexicans have for centuries stored and are still storing fodder in this way.

In this State ensilage-making has by no means been taken up seriously, and we are a long way behind the other States of the Commonwealth in the amount of ensilage made, although the credit for being the first man in Australia to store fodder in this way is always given to the late Mr. Charles Rake, of Enfield, South Australia, who not only made it, but who did a lot to encourage its manufacture in the country.

This form of fodder in most cases has been much over boomed by its advocates, and understated by its opponents, and because of this, and the fact that not much forage is stored in this manner in the State, ensilage generally is far from understood by South Australians, and so not appreciated.

The definition of the term "ensilage" or "silage" at the present day, is, the article obtained by storing green succulent forage so that it retains its succulence and much of its green color; and the word "silo" stands for the air-tight receptacle used for storing this succulent fodder.

Ensiling a fodder or making ensilage consists then in preserving green, succulent plants, so that they will remain green or semi-green, and keep their succulence for a considerable time. Briefly it is done by cutting the plant growth to be made into ensilage when very green and nutritious, and storing it under pressure, usually in air-tight receptacles of some kind, but sometimes in open stacks. Originally, ensilage was always made in underground pits, the earliest ones being no more than holes in the ground, but later on these were improved on by using masonry bottoms and sides. These underground chambers were followed by overhead receptacles made of various materials, and these again by stacks made in the open air. In all cases considerable weight is applied, and the resulting forage is the same, the difference between the various methods having to do mainly with the ease of handling the green stuff or the finished article, and with the amount of waste in preparation.

More or less considerable changes occur in the making of ensilage, between the times when the growth is cut and its removal from the silo or stack, and as these changes are all-important in the manufacture and keeping of this class of forage, it is very necessary to understand them more or less fully.

CHANGES OCCURRING IN THE MANUFACTURE OF ENSILAGE.

The changes that take place in forage stored as ensilage are of both a chemical and a physical nature, but whilst the chemical changes are great and of much importance, the physical ones are only of minor consideration. Under all methods of making and storing this class of fodder, the changes that occur are the same, but the degree of change varies with the method of manufacture adopted.

CHEMICAL CHANGES.

If any green, succulent growth be thrown together in a heap there is very quickly a rise in temperature, and this rise in temperature is usually taken to have been caused by bacterial action. This view has been proved to be only partly true, and it is understood nowadays that something like the following happens:—

The bulk of the cells of the plants are still alive when the mass is thrown together in the heap, and these cells continue to breathe up oxygen and give off carbonic acid gas, and as is the case with all other forms of life, in this process heat is evolved. These cells continue so to breathe while ever there is free oxygen present, and as soon as they have used all of this free oxygen, if the heat evolved is not sufficient to kill the cells, they begin extracting oxygen from their own materials, which effort, combined with the rise in temperature causes the death of the cells. The rise in temperature and death of the plant cells is a very rapid process, for there are millions of living cells thrown together in the mass, all breathing oxygen from a limited supply; and as the loss of heat from the mass is very slight it is stored up, and if enough oxygen is present, it quickly rises to the temperature necessary to kill the cells. It is not until after the plant cells are killed that the much talked of action of bacteria comes into very active play, but then if it is allowed a free run, it will lead to the complete decomposition of the material in the heap until it is indistinguishable from well-rotted farmyard manure.

Now it is recognised that the plants as they grow have the bacteria that will lead to their decomposition, if suitable conditions offer, literally all over them. It is also known that the temperature surrounding these plants has only to be raised sufficiently high to kill all the cells and the bacteria sticking to the outsides of the plants, and this is what we work on in making ensilage. The rise in temperature, caused in very large part by the breathing of the cells, finally gets high enough to kill the plant cells and most of the bacteria, and then we step in and prevent any other bacteria and any further supply of air from finding their way into the material, and so very little further change takes place. This very briefly is one explanation of the preservation of the fodder in a succulent form, but it only applies in making what is known as "sweet" ensilage.

All types of bacteria (or ferments) in the splitting up of organic matter, or in fermentation as it is more commonly termed, attack special substances in the organic matter and produce as a result of their activities a substance peculiar to the type of bacteria doing the work. One of the commonest instances of this is the action of yeast, which attacks sugar in solutions, splitting it up and leaving as a by-product, alcohol. Now the by-product set free by each special kind of bacteria accumulates until in the end there is sufficient of it to act as a poison to the bacteria that produced it, either killing them or at least checking their activities. This is commonly seen with our friend the yeast in the making of sweet wines; here enough sugar is provided in the first place, so that the ferment produces sufficient alcohol to check their own activities, and the finished article has sugar left in it, although the yeast was not killed by artificial means. This is what happens in making what we know as "sour" ensilage; the temperature is not allowed to rise high enough to kill all of the bacteria on the original green stuff, although some are destroyed, and those remaining alive—chiefly lactic acid ferments—continue their work, in most cases leaving as by-products various acids of which lactic acid is the chief one, until the acids formed are present in large enough quantities to stop their work.

It is only reasonable to expect that with the last effort of the cells and the work of bacteria there must be some loss of material, but for all this there are still some people who say that there is no loss whatever. This loss is of course always shown when ensilage is analysed, and invariably there is a more or less considerable difference between the finished article and the original green stuff used in its manufacture, and as far as nutritive value goes the difference is always much in favor of the green stuff. The following table built up from the "Scientific Feeding of Animals," by Professor O. Kellner, clearly shows this:—

Table 1.—*Showing Losses in Nutrients by Ensiling the following Fodders.*

Crop.	Condition.	Crude Nutrients.					
		Water.	Crude Protein.	Crude Fat.	Nitrogen-free Extract.	Crude Fibre.	Ash.
		%	%	%	%	%	%
Lucerne ...	Green	76·0	4·5	0·8	9·6	6·8	2·3
	Pit Ensilage ..	83·1	3·7	1·4	4·8	5·0	2·1
	Stack Ensilage.	72·5	4·0	3·2	6·1	10·7	3·5
Maize	Green	80·6	1·7	0·5	10·4	5·6	1·2
	Pit Ensilage ..	81·5	1·6	0·8	9·0	5·7	1·4
	Stack Ensilage.	81·8	2·0	1·2	7·8	5·5	1·7
Oats	Green	76·8	1·9	0·6	10·4	8·5	1·8
	Pit Ensilage ..	76·3	1·9	0·8	10·7	8·5	1·8
Rye	Green	76·6	3·0	0·9	10·3	7·5	1·7
	Pit Ensilage ..	86·9	1·6	0·5	5·7	4·4	0·9

Table 1.—Showing Losses in Nutrients, Etc.— continued.

Crop.	Condition.	Digestible Nutrients.						
		Crude Protein.	Crude Fat.	Nitrogen-free Extract.	Crude Fibre.	Value (full value 100).	Digestible Protein.	Starch Equivalent per 100lbs.
		%	%	%	%		%	Lbs.
Lucerne ...	Green	3·2	0·4	6·3	2·9	79	1·7	9·1
	Pit Ensilage ..	2·5	0·7	3·3	2·1	81	1·5	6·6
	Stack Ensilage.	3·0	1·6	4·2	4·3	61	1·2	7·8
Maize	Green	1·0	0·3	6·7	3·1	83	0·6	9·1
	Pit Ensilage ..	0·8	0·4	6·2	3·2	82	0·4	8·6
	Stack Ensilage.	1·2	0·6	4·8	3·2	81	0·5	7·8
Oats	Green	1·4	0·4	6·5	4·9	75	1·2	10·0
	Pit Ensilage ..	1·1	0·4	5·9	5·1	72	0·6	8·9
Rye	Green	2·1	0·5	7·0	4·9	80	1·4	11·3
	Pit Ensilage ..	0·9	0·2	3·4	2·6	81	0·5	5·6

The above table for all the fodders indicated, shows that the feeding value per ton is very much higher as green stuff than as ensilage; and further than this there is a very considerable loss in weight during manufacture, which increases the losses shown in the above table. Even where the best of care is taken the loss in preparation is estimated at anything from 10 per cent. to 20 per cent.

At Roseworthy Agricultural College in 1909, Professor Perkins had this question considered with the following results:—

The ensilage crop that year was a sown mixture of wheat and oats which was weighed on a weighbridge and immediately chaffed into an ensilage pit, every proper care being taken that no extraordinary losses occurred around the cutter. The pit used had a capacity of 3,400 cub. ft. and was 14ft. deep, and into this pit there was chaffed 54.78 tons of green forage. This ensilage when prepared was fed to stock gradually in the usual way, everything removed being weighed immediately, and there was taken from the pit 47.93 tons including 3 tons 10cwts. 21lbs. of spoilt material. Now this represents a loss of 12.5 per cent. on the material put into the pit, and if the 3 tons 10cwts. 21lbs. of spoilt material be taken as of no feed value, the loss then reaches 18.91 per cent.

The losses that occur are mainly in the nitrogen-free extract (composed mostly of carbohydrates) and in the proteins; and these parts of the fodder invariably show a rather considerable loss. The other digestible parts, excepting the crude fat, usually show a loss, but not necessarily so, whilst the crude fat always shows a gain. This increase in the crude fat content appears to be due to the formation of lactic acid and other substances soluble in the ether used to extract the fats.

That these losses are considerable will be seen by a glance at the following table, built up on Kellner's analyses for lucerne and maize shown in table 1, assuming that the actual loss of weight was 15 per cent. of the original:—

Table 2.—Showing Losses in Ensilage-making.

	Fodder.	Crude Protein.	Crude Fat.	Nitrogen-free Extract.	Crude Fibre.	Ash.
Lucerne—						
Green (lbs.)	100	4.5	0.8	9.6	6.8	2.3
Ensilage, pit	85	3.1	1.2	4.1	4.3	1.8
Loss (lbs.)	15	1.4	+0.4	5.5	2.5	0.5
Loss (per cent.)	15	31.1	+50.0	57.3	36.8	21.7
Maize—						
Green (lbs.)	100	1.7	0.5	10.4	5.6	1.2
Ensilage, pit (lbs.)	85	1.4	0.7	7.7	4.8	1.2
Loss (lbs.)	15	0.3	+0.2	2.7	0.8	—
Loss (per cent.)	15	17.6	+40.0	26.0	14.3	—

PHYSICAL CHANGES.

The physical changes that take place between the green stuff put into silos and the prepared article are not of much importance; they are—

Some change in color, the fodder going more or less brown, although if very carefully prepared from plants that are not very sappy the material remains fairly green. The ensilage becomes very strong smelling and often extremely unpleasant to human beings, but even if this has any deterrent effect on livestock they very quickly overcome it, and really its odor appears to be rather attractive to most livestock. The taste is considerably altered in manufacture, largely due to the amounts of acids formed, but this again appears not to worry stock in any way, once they have been persuaded to eat any of the fodder. The tissues of many plants made into ensilage are considerably softened, and most advocates of this class of fodder claim that it is much more digestible because of this softening of the tissues. This is not necessarily so, for although the crude fibre and the crude fat are made more digestible, the proteins and carbohydrates do not appear to be so affected.

The following table made up from figures in Kellner's "Scientific Feeding of Animals" dealing with green maize and maize ensilage shows this: the figures were obtained from 16 separate investigations with the former fodder and 25 investigations with the ensilage:—

Table 3.—Digestibility Co-efficients.

	Crude Protein.	Crude Fat.	Nitrogen-free Extract.	Crude Fibre.	Digestibility Value.
Green Maize	65	72	73	67	82
Maize Ensilage (pit)	51	80	67	71	82

IN PRACTICE.

Now, as has been already pointed out, what we have to do is to preserve succulent fodder so that it remains in a succulent condition, and to do this we must control the temperature to which the mass of green stuff rises (1) so that the bulk of the bacteria are killed along with the cells of the plants, or (2) so that the cells and most of the bacteria except the lactic acid forming ones are killed. In the first case the temperature is allowed to get fairly high before being checked, and in the other the check is aplied before the temperature gets high enough to kill all of the useful bacteria. We must remember that it is only necessary to put green succulent growth in a heap, and the temperature will rise, due to the combustion that takes place in the activities of the living cells and the bacteria; and the slower this mass is put together the greater will be the rise in temperature. This is only reasonable because both the cells and bacteria are very active when the supply of oxygen is large, and when the green stuff is put together quickly the weight on the mass is quickly increased, so compacting it that the air is squeezed out of it with the resulting check on the oxygen-loving life. Briefly, then, in the making of ensilage we put a mass of green forage together and then weight it down to compact it together and so squeeze out the air, and prevent any more entering it. In practice we make ensilage by cutting the green fodder to be preserved while it is still very succulent, the best stage of development in most plants being when in flower, or soon after, and then cart the cut stuff to the ensilage pits without allowing it to wilt any more than is possible. The exceptions to this latter part of the treatment are the very succulent and watery plants such as rape, cabbages, etc. which preserve very much better if some of the moisture is allowed to dry out of them. The freshly cut plants are then put into the silo—preferably after being chaffed, as it packs together so much better—in regular, even layers and the edges and corners are well tramped down. This regularity of placing and the tramping of edges are both very necessary, so as to exclude as much air as possible whilst filling, and to overcome any lateral shrinking, which, admits air down the sides of the silo, and so leads to increased losses. This filling of the silo continues until all the material we wish to store is exhausted, or better still until the silo is full, and then weights are applied to quickly compact the material, which as already explained checks any further rise in temperature. Wherever possible the silo should be more than filled, because the mass of stuff sinks very considerably when it is being compacted together with the weight that is added to the top. Where the ensilage material is chaffed into the silo it will stand stacking to a height of about quarter the depth of the silo over and above the top edge. In the experiments conducted at Roseworthy Agricultural College by Professor Perkins, a pit 14ft. deep was stacked to 2ft. above the top edge and then the weight was applied, and in 52 days the surface had sunk 1½ft. below the top edge of the pit, a total shrinkage of 3½ft. in 16ft. or 22 per cent. in 16ft.; and it means that a pit 12ft. 6in. deep piled up to a height of 16ft. would, when it had finished shrinking, be just level with the top. This amount of shrinkage will naturally vary with the depth of the silo, and will be greater in a deep silo than in a shallow one, because of the extra weight of the material. To save good feeding material it is wise to put a layer of straw, cocky chaff, or such like roughage on the top of the fodder before applying the weights, as otherwise the part exposed to the air for the depth of a few inches will always decay and be quite useless for stock.

The weight necessary to consolidate the ensilage and to check the rise in temperature is differently stated by nearly everyone that gives advice on ensilage making, and in practice I think you will find that they are all just about right; anything from 56lbs. to 1cwt. to the square foot of top surface gives about equal results, and all materials are about on the level, anything from even-sized concrete blocks to rough timber or bags of soil are as good as one another. As most farms carry a supply of fencing posts, either new or old, the top of the silo is a good place to stack them, they are a convenient weight to handle both for putting on and throwing off, and they are convenient things for calculating the weight applied. If you put one fair sized fencing post to every square foot of top surface, you will have enough weight on the ensilage to do all that is required; for instance a pit 15ft. by 15ft. has a surface of 225 sq. ft., and 200 to 250 fair sized posts will weight down that pit beautifully.

SWEET AND SOUR ENSILAGE.

The two kinds of ensilage, namely, "sweet" and "sour" have their own friends and advocates, and the difference between the two lies in the fact that one has more acid in it than has the other.

"Sweet" ensilage is produced by following the first method described above, *i.e.*, allowing the temperature to rise fairly high before checking it by applying the weight. Theoretically, the temperature should reach 140deg. to 160deg. F., and then weight should be put on, of course, before the pit is full by putting on more fodder, and after full by using the final weights. In practice no thermometer is used, as we know that so long as the plant growth being used has not wilted much, heat will be quickly generated, and we regulate the amount of stuff put into the silo so that this temperature is not exceeded. It is impossible to say just what weight to put into the silo daily, because of the variations in sizes and conditions generally, but on an average if 4ft. to 5ft. deep of material be put in the silo every day, and the lot be weighted as soon as completed, "sweet" silage will result; this amounts to about 6 to 7 tons to the 100 sq. ft. of surface daily.

"Sour" ensilage is made by preventing the temperature reaching more than about 120deg. F., which is done in practice without reference to thermometers by filling the silo as quickly as it can be got together and weighting it down immediately.

From the feeding point of view, there appears to be little to choose between these two forms of ensilage, despite the exaggerated statements of their special advocates, and the kind to be made depends usually on the maker; if he has plenty of help and wants to get the job of ensilage out of the way, he will make "sour" ensilage, but if he is working short-handed he will make "sweet" ensilage.

"Sweet" ensilage has one advantage over the "sour," and that is that it is not nearly such a strong smelling fodder, and so less liable to be objectionable to human beings.

Salt is often used in making ensilage to make the material more palatable to livestock, and of course to make it a more health-giving fodder, and is applied at the rate of about 14lbs. to 10 tons of fodder by sprinkling it evenly on the layers as they are put into the silo.

It is also advocated as a great help in keeping down the temperature of the mass, but in practice there appears to be but little danger of the ensilage getting too hot, unless for some extraordinary reason a silo with but little material in it had to be left for some days in warm weather without adding any more material or weights. If such a proceeding could be foreseen the applying of about 14lb. of salt to every ton in the pit, would prevent the temperature from rising too high, would be easier than putting on weights and removing them again when ready to go on filling, and would rather improve the fodder.

FODDERS USED FOR ENSILAGE-MAKING.

The idea, unfortunately still not dead, that any growth will make good fodder as ensilage is too ridiculous, and a glance at the tables given above should quickly dispel that notion, as they show that the loss is enormous, and that although the digestibility of crude fat and crude fibre is improved, still on the whole the digestibility of the green forage and ensilage are the same. Ensiling will certainly make fodder of some plants, which because of coarse tough tissues, hairy or spiny leaves, etc., are not eaten at all readily by livestock, because it softens these objectionable tissues, and further it is a very good way of conserving fodders that for some special reasons do not make good hay, such as maize, sorghum, rye, barley, millet, peas, etc.; but they must be taken as axioms in ensilage-making (1) that only good fodder will make good ensilage (2) that the better the fodder the better the ensilage. Indeed, ensilage-making is too often thought of as a method of making fodder, whereas it should only be considered as a means of storing a fodder, and even at that one that does not as a rule improve the growth put into it. In this respect it is hard to realise any treatment that will improve on a good succulent green feed in its natural state as a fodder for grazing livestock.

Remembering that any plants which are fodder for livestock when in the green state can be stored as ensilage if handled in an intelligent manner, and that the better the forage used for the purpose the better the quality of the resulting feed, the materials to be used in the silos will depend wholly on what can be grown to best advantage in the particular conditions in which one is situated. In this respect, in this State, the main governing factor will be whether the crops are grown with irrigation in the summer or only by the rainfall in the winter and spring. In the first case, the bulky fodders such as maize, sorghum, etc., are worth first consideration, and the common irrigation crop—lucerne—that does so well in South Australia will, although it makes good ensilage, be used to better advantage cured as hay, and in that form be fed to livestock mixed with the ensilage made from other types of crops. Where crops are grown without irrigation the cereals, wheat and oats, particularly if grown as a mixture, always take first place as an ensilage crop, with peas as a very good crop for the purpose in the better districts of the State.

Where rough stuff such as thistles, artichokes, and weeds generally, are used for ensilage-making it should be seen to that these are mixed together, for instance if using thistles, Cape weed, and grass, the resulting ensilage is of much more even texture and better quality generally, if when filling they be put into the silo so as to become mixed, as a load of thistles, a load of grass, then a load of Cape weed, and so on, rather than put in all thistles first, then all grass, and then all Cape weed.

In considering fodder crops to be stored as ensilage, it is as well to leave the crops known as cruciferous, such as rape, kale, cabbage, mustard, etc., out of the question, for besides being very watery crops and so in need of much more care in manufacture, their characteristic rank odor is rather increased than decreased when made into ensilage, and so taint dairy products rather badly. If to be used at all it should only be in mixtures, preferably with grasses or cereals, and then only when they do not predominate in the mixture.

SILOS.

A silo is really any receptacle in which green forage can be stored so that it retains its succulence, without the whole mass decaying, and to fulfil these requirements such a receptacle need only be fairly air-tight, and so placed that water does not soak through the sides into the material being stored. Naturally the more perfect the silo as regards being air-tight and so also water-tight, the better the final product and the lower the percentage of waste.

Originally silos were just holes dug in the ground, these were improved on by using masonry on bottom and sides, these again improved on by building the silos wholly above ground of various materials such as masonry, wood, iron, compositions, etc. Finally silos are being done without altogether, and the forage is being stored as ensilage in open stacks.

Where a silo is being constructed of any of the above types there are some essential features that must be considered. The bottom and sides must be both air and water tight, as much ensilage is spoilt by air or water being admitted—when air enters moulds start growing and the silage is wholly spoiled, when water in quantity gets in, the material in the water just rots down like stable manure.

The sides of the silo should be perpendicular and as smooth as possible, so that in sinking the whole mass goes down regularly and evenly, if this does not happen every opportunity is given to the entrance of air, which means increased losses.

The silo should be deep in proportion to its other dimensions, this of course means an increased weight on all below the surface, and so a better expulsion and exclusion of air, less surface exposed to atmosphere agencies, and as silos are always emptied gradually, less surface exposed after each day's feeding is removed.

The silo should have as few corners as possible, as corners make it difficult to pack the material tightly when filling, and they retard the sinking of the mass, so admitting air; the silo that fulfils this condition best of all is the circular silo.

EARTH PIT SILOS.

Originally ensilage was stored only in holes made in the ground, but nowadays this method is not used to any great extent, because of the fact that the loss of material in this form of silo is rather enormous. Such a pit should be sunk in soil that is of a water-tight nature, and in a position where surface water is not liable to run into the pit, and also where the ground water does not rise to the height of the bottom of the pit. Such a place will be found at more or less slight rises in clayey soils. The pit can be excavated with ploughs and scoops in a manner similar to dam making, but under this method the finished hole usually has too much surface in proportion to its depth, so it is better to do the work by hand, although it may be started by horse implements, and finished by hand. The sides should be nearly perpendicular, and finished off so that they are more or less smooth. Although the waste of forage stored is in such a receptacle fairly high, still in a climate like ours they can fill a very useful purpose by keeping off the ill effects of drought. These pits can be very cheaply constructed, and in years of rank growth of forage if more of them were made and filled, we would hear less of the losses of stock during our bad times.

They would be filled by cutting the rankest of the pasture, carting it straight to the pit, emptying the conveyances into the pit and piling it up so that the heap extended about one-third of the depth of the pit above the surface, say with a 12ft. deep pit the green stuff would be piled up until 4ft. above the ground level. The earth taken out of the hole is then spread evenly over the fodder to act as a weight and a cap to seal the ensilage. Where the hole was taken out by horse teams the conveyances carting material would in every case drive right into the hole with their loads, in this way consolidating the mass every trip.

That this method of storing fodder in times of plenty against times of drought is possible, was demonstrated at the Royal Agricultural Society's Show in Adelaide in 1914, when there was a very fair sample of ensilage exhibited that had been stored in an earth pit for over 20 years at Strathalbyn.

MASONRY PIT SILOS.

This form of silo is an improvement on the earth pit in that the bottom and sides are made air and water tight, and the sides made smooth and perpendicular with masonry work. The losses in such a pit are comparatively small, and the structure will last indefinitely providing cracks do not appear in the walls. The disadvantage of this class of silo is that everything has to be lifted up out of it, but this is overcome to a very large extent where the pit can be constructed in the face of a hill, here the exposed wall has doors, built into it so that the ensilage can be removed with the minimum of lifting. A roof on such a silo is not an absolute necessity in such a dry climate as is ours, as it takes a good lot of water to spoil ensilage once it is cured. it will absorb a large amount of water and it is only when it is actually standing in water that decay sets it. A roof although not a necessity is a saver of waste and should be provided where convenient, particularly in districts with a heavy rainfall. These pits should be much deeper than their surface measurements, and some writers go as far as to say that for the very best results the pits should be two to three times as deep as they are broad. When filled and heaped up the surface should be covered with straw, cocky chaff, or some rough forage, and the weights immediately applied.

Overhead Silos.

This form of silo has in many places where much ensilage is made almost completely superseded the underground pit, and mainly because it is much easier at the time of filling the silo to lift everything to the top than it is to lift everything out at emptying time. It has the additional advantage of having its sides, both inside and outside, exposed and easy to get at for any repairs that may become necessary. It can be made of any material that can be made air-tight, and which is strong enough to stand the inside pressure; in other countries wood is very largely used in their manufacture, but here added to the high price of timber we have to consider our climate, which is very severe on exposed wood. Iron silos are used successfully, but the acids in the ensilage act on this material unless protected, and so they need much care bestowed on them. Reinforced concrete overhead silos, when all things are considered, are probably the best of all. When properly constructed they are practically everlasting and are less affected by exposure, climatic changes, and the action of the acids in the ensilage.

In practice the class of silo used will depend wholly on how every individual wishing to construct one is situated. For storing large quantities of fodder as ensilage the overhead silos have proved themselves as the most suitable, mainly because of the increased ease of handling, but for the man in a smaller way who has material at his disposal, the underground pit, or better still the half underground pit, constructed on the side of a hill, will prove just as economical.

Capacity of the Silo.

The weight of ensilage is usually taken as being represented by 50 cub. ft. to the ton, and so the capacity of a silo is easily calculated. In the experiments conducted at Roseworthy Agricultural College and referred to above, this figure was tested with the following result. Here the crop consisted of a mixture of wheat and oats which was chaffed into a 14ft. deep silo, and heaped up another 2ft. making 16ft. of green stuff, and each ton occupied 71 cub. ft. of space, this when the shrinkage had finished was reduced to 55½ cub. ft. to 1 ton. This figure, of course, will vary with the material being used, on its succulence, the depth of the silo, and on the weight used on the top, but on the average the figures 70 cub. ft. per ton for chaffed green stuff and 50 cub. ft. per ton for cured chaffed ensilage are probably very near the mark, and at all events will be quite close enough for calculating capacities. If one has a pit or overhead silo of which they wish to know the capacity, it is only necessary to multiply the surface area in square feet by the depth in feet, and divide the result by 50 to know how many tons of cured ensilage the silo will hold when quite full. If the silo has a roof on it so that it can only be filled, and not heaped up above the top edge, divide by 70 instead of by 50. But if a person is thinking of building a silo, another calculation has to come in, and that is to decide how much ensilage to allow for. If the object in view is the providing of ensilage for dairy cows only, you have first to decide on number of cows to feed and length of time for which they are to be fed. For instance, if it is decided that enough ensilage is wanted to feed 20 cows for 16 weeks, the capacity of silo is arrived at by multiplying 112 days by 60lbs. (the amount of ensilage a cow will eat in a day) which equals 3 tons of ensilage per cow; this again multiplied by 20 cows equals 60 tons of ensilage required. Now 60 tons will occupy 3,000 cub. ft. (60 by 50), and if depth of silo is to be 20ft. the surface of silo will be 150 sq. ft., equal to about 12ft. 3in. square.

STACK ENSILAGE.

The simplest way to make ensilage is to dispense with the silo and just make an open stack of the succulent green fodder, weighting it down as soon as completed. The cured article from a stack is just as good as from a silo, but as is only reasonable to expect the loss is very high, considering that all sides of the stack are exposed to the weather, but this outside quickly decays and forms a solid mass that thereafter seals the remainder of the forage from air and moisture. It is very essential that a dry spot be chosen for the site for stack ensilage, as surface water quickly damages the bottom of the stack and may let it down; this site should be covered with stone and rolled like a road or else plenty of dunnage put down before commencing the stack. The procedure then followed is the same as for silo ensilage, the fodder being put together slowly if "sweet" ensilage is required, and hurried together if "sour" forage is needed. The top is built up with a steep roof to run off the rain that falls, and this can be covered with earth with advantage to run off water, and act as a seal to the top, and weights are immediately applied. More or less elaborate pressure-applying apparatus is sometimes provided to use instead of putting on weights, but they are in many cases found to be hardly worth the expense as compared to ordinary odds and ends as weights. The stack can be weighted in the same way as is a hay stack to keep on loose straw by passing wires across the stack from side to side and hanging posts or other weights on either ends of the wires. Before placing the wires, three of four boards should be placed on each side of the gable running the full length of the stack so as to distribute the pressure of the wires; if this is not done the wires will cut into the soft sappy fodder at the ridge and the eaves, so not giving the regular pressure necessary to produce a good article. The wires should be no more than 1ft. apart and should have at least 1cwt. on each end of them. After weighting, the stack will need constant attention for the first few weeks as it sinks so very rapidly that the weights will reach the ground and so the all-important pressure will be lost; when this occurs the wires must be shortened, and the weights raised so that they act on the stack.

When ready to use the stack is opened at the end least exposed to the weather, and each day's requirements is cut out with a hay knife; too big a surface would be exposed if the whole top were opened as is done with a silo.

In making stack ensilage the loss is reduced if all material used is allowed to wilt a little before going into the stack, but at the same time of course much of the succulence is also lost by doing this.

USING THE ENSILAGE.

The main use to which ensilage is put is in the feeding of milking cows, and despite the fact that some of its advocates go so far as to make the claim that all fodders should be stored in this way and fed to all the livestock on a farm, it will remain a food for milking cows except in a few isolated cases. The losses of nutrients in the preparation of ensilage are so high that in a climate like ours where we can almost depend for a certainty on getting good haymaking weather, ensilage-making will never be more than a method of storing feeds not fitted for haymaking and for providing a succulent feed. The succulence of ensilage is the advantage that it holds over hay in our dry climate, and it is just this property that makes it a milking cow's feed, for it keeps up the flow of milk when this would otherwise be checked by putting the cows on dry feed. Fed alone to cows they will eat somewhere about 60lbs. per day each, but as the analyses quoted above show that much protein (the nutrient lacking in most fodders) is lost in preparation, it should really be fed in conjunction with other foods richer in proteins, for instance a better food than ensilage alone would be, say, about 40lbs. ensilage with some lucerne chaff and a little bran. If ensilage be fed in the morning to cows, it is claimed that they can safely be grazed all day without danger of bloat.

Sheep eat ensilage readily and do comparatively well on it, and will eat about 8lbs. to 10lbs. a day, but they also do better if some other feed is supplied, such as hay chaff. Horses do not take kindly to this class of food as a rule when it is first put before them, but they soon get to like it, and for spare horses and youngsters it is a good fodder. It appears to be the general experience, however, that it has a much too softening effect on working horses. Care is necessary in feeding ensilage to horses, for if they should by any chance get some of the mouldy portions, it quickly upsets their digestive systems. Pigs are kept in good health by having some ensilage with their other feed, but to this class of animal it is of less use than to any others of the farm livestock.

GENERAL.

In the countries with colder, wetter climates than ours, the farmers often experience much difficulty during haymaking operations due to continual wet weather. To these people ensilage making is an easy way of storing forage, as there need be no delays, because rain does not affect the quality of the ensilage, and so the carting of the green stuff can be continued even though rain be falling at the time.

Fodder stored as ensilage is quite safe from damage by fire, mice, birds and, if in a silo, from stock—all things liable to destroy hay. In cereal-growing districts the cutting of a crop for ensilage is a good way to rid the land of weeds, as the cutting comes before they have ripened their seeds; the early cutting is always followed by enough second growth to provide good grazing. In most years in cereal-growing districts the ensilage crop is cut by October, this gives every chance of preparing the land for a crop the following year.

In parts of the United States of America some makers of ensilage are not weighting down their forage at all, and they claim that the article is as good as when weighted and that the losses are very little greater, but here it has been the common experience to find that the losses are rather high from mouldiness unless weights are applied for a short time.

As a rule it takes six to eight weeks after filling before the changes between green forage and ensilage are completed, but if for any reason it would be advantageous to feed before that time was up, no ill effects would result, in fact it would be quite all right to start using the material for feed as soon as the temperature had dropped.

SUMMARY.

1. Ensilage is green succulent fodder stored so that it retains its succulence and much of its green color.

2. If any green plants be thrown together in a mass the temperature rises, and ensilage is made by controlling this rise in temperature and preventing it from getting too high.

3. The rise in temperature is caused by the activities of the live plant cells and bacteria in the presence of free oxygen; it is controlled by applying weight, which squeezes out the air and prevents its re-entry to the mass.

4. "Sweet" ensilage is made by allowing temperature to reach 140deg. to 160deg. F. before checking; this temperature kills the cells and most of the bacteria, and if air is now shut out very little further change takes place. In practice it is done by filling the silo slowly.

5. "Sour" ensilage is made by not allowing the temperature to rise above 120deg. F., which temperature does not kill the lactic acid ferments, and so fermentation continues until there is an excess of acids formed. In practice it is done by filling the silo as quickly as possible and immediately applying the weights.

6. In places it is being stated that weights are not necessary, but South Australian experience shows that the loss of material where 56lbs. to 112lbs. to the square foot of surface is not used is very large.

7. In the making of ensilage the losses of nutrients, and so total weight are high, and the general digestibility of the fodder is not improved to the extent often claimed for it.

8. It is a good method of storing fodders that make poor hay, and of making useful feed of some plants not readily eaten in the green state by livestock.

9. The fodders used for ensilage-making in South Australia will depend largely on whether they are used in irrigation districts or not. Under irrigation, maize is first choice, away from irrigation the cereals, wheat and oats.

10. Ensilage because of its succulence is a first-class feed for milking cows when green feed is short; it is useful to the other farm livestock.

11. Type of silo built depends largely on circumstances, but for all types the circular silo is to be preferred.

12. The good part of stack ensilage is as good as silo ensilage, but the losses in preparation are high.

13. Where wet weather makes haymaking difficult, ensilage can be stored without danger.

14. Ensilage takes some weeks before properly cured, but still it can be used as soon as the rise in temperature has been checked.

THE SEASON, 1916-17.

REPORT AND FINAL RESULTS OF THE CEREAL, HAY, AND FODDER CROPS.

The final results of the 1916-17 harvest, according to the report prepared by the Government Statist (Mr. W. L. Johnston) show a total yield of wheat for the season of 45,745,064bush., and an average of 16.46bush. per acre. The yield of hay of all kinds was 615,059 tons, an average of 1.27 tons per acre. The corresponding figures for 1915-16 were:—Wheat, 34,134,504bush., average 12.46; hay, all kinds, 1,100,127 tons, average 1.55.

Acreage Under Cultivation, 1916-17.

The total acreage under all kinds of cereals for grain, hay, fodder, &c., was 3,561,855 (3,700,782), a decrease of 138,927 acres.

Wheat.—3,112,479 (3,220,645) acres were sown, a decrease on the previous season of 108,166 acres. This area was distributed as follows:—Grain, 2,778,357 acres; hay, 323,633 acres; fed off, 10,489 acres.

Barley.—107,765 (92,678) acres were sown, an increase of 15,087 acres, being 13,726 acres greater than the previous record of 94,039 acres in 1913-14.

Oats.—306,730 (320,901) acres were sown, a decrease of 14,171 acres.

Fallow.—The total acreage of land placed in fallow during the season was 1,491,319 (1,558,076) acres, a decrease of 66,757 acres.

Area Under Crop, Season 1917-18.

The change in the period for the general collection of statistics rendering it possible, the collectors were directed to obtain at the same time a record from each farmer of the area sown for the coming season, and from these records the total area sown for grain, hay, and fodder for the season 1917-18 is estimated to be as follows:—

Wheat, 2,642,945 (3,112,479) acres, decrease 469,534 acres.

Barley, 105,909 (107,765) acres, decrease 1,856 acres.

Oats, 222,862 (306,730) acres, decrease 83,868 acres.

At the date it was not possible to collect any reliable information as to the area to be cut for hay, but in view of the general burning of the old haystacks owing to the mice plague, not less than 300,000 acres of the above wheat area may be expected to be cut for hay. The crops generally are promising well up to the average of good seasons.

PRODUCTION, 1916-17.

The following is a summary of the wheat and wheaten hay production in divisions in comparison with the yields for the previous season:—

Division of State.	Total Area under Wheat (Grain, Hay, and Fed Off)	Wheat.		Wheaten Hay.	
		Yield.	Average.	Yield.	Average.
	Acres.	Bush.	Bush.	Tons.	Tons.
Central	1,006,647 (1,036,518)	13,967,722 (10,220,051)	16·40 (12·78)	212,931 (391,059)	1·41 (1·66)
Lower North	876,640 (960,387)	15,680,207 (12,697,679)	19·97 (15·54)	128,707 (244,224)	1·45 (1·72)
Upper North	363,548 (335,387)	5,919,094 (3,380,792)	18·45 (11·47)	56,563 (57,871)	1·35 (1·45)
South-Eastern	354,879 (378,472)	3,958,026 (4,050,893)	11·70 (11·54)	14,001 (28,374)	·93 (1·09)
Western	510,417 (509,544)	6,217,015 (3,783,739)	12·90 (7·94)	24,521 (32,846)	·94 (1·02)
Outside Counties	348 (337)	3,000 (1,350)	11·11 (7·50)	90 (142)	1·15 (·90)
Total 1916-17	3,112,479	45,745,064	16·46	436,813	1·35
Total 1915-16	3,220,645	34,134,504	12·46	754,516	1·58

The area sown with wheat for all purposes, while 108,166 acres less than the previous season, was considerably above any former season. The extent of increase or decrease in acreage and yield for each division was as follows:—

Division.	Total Area under Wheat (Grain, Hay, and Fed Off)	Wheat.		Wheaten Hay.	
		Yield.	Average.	Yield.	Average.
	Acres.	Bush.	Bush.	Tons.	Tons.
Central	–29,871	3,747,671	3·62	–178,128	–0·25
Lower North	–83,747	2,982,528	4·43	–115,517	–0·27
Upper North	28,161	2,538,302	6·98	–1,308	–0·10
South-Eastern	–23,593	–92,867	0·16	–14,373	–0·16
Western	873	2,433,276	4·96	–8,325	–0·08
Outside Counties	11	1,650	3·61	–52	0·25
Total State	–108,166	11,610,560	4·00	–317,703	–0·23

Hay.—The cut of hay was 615,059 tons, a decrease of 485,068 tons on the record crop (1,100,127 tons) of the previous season, and the average per acre was 1.27 (1.55) tons. Wheaten hay yielded 436,813 (754,516) tons, and though this was a decrease of 317,703 tons, it was only 13,568 tons less than the average cut.

Barley.—The yield of 1,734,420bush. of barley, with the average of 16.74bush. per acre, gives an increase of 36,750bush. over the record yield of 1,697,670bush. in the previous season.

Oats.—The yield of oats was 1,839,541bush., which has only been exceeded by the record crop of 2,134,374bush. of the previous season. The average per acre was 12.13 (16.87) bushels.

The production of barley, oats, and hay in the several divisions of the State, in comparison with the previous season, was as follows:—

Division.	Barley.			Oats.	Hay (all kinds).
	Total (including other).	Malting.	Cape.		
	Bush.	Bush.	Bush.	Bush.	Tons.
Central	1,040,291	810,195	209,378	603,950	284,194
	(1,048,728)	(776,502)	(263,359)	(655,502)	(538,370)
Lower North	139,706	54,309	64,831	249,362	161,063
	(154,517)	(66,180)	(78,790)	(229,419)	(320,070)
Upper North	8,212	2,899	3,511	31,009	60,340
	(10,835)	(1,198)	(7,165)	(29,617)	(67,017)
South-Eastern	446,748	395,728	46,122	602,880	68,582
	(368,375)	(317,213)	(48,429)	(765,093)	(106,320)
Western	99,263	77,171	19,739	352,340	40,775
	(114,465)	(88,332)	(23,548)	(454,743)	(68,192)
Outside Counties	200	—	—	—	105
	(750)	(750)	—	—	(158)
Total 1916-17	1,734,420	1,340,302	343,581	1,839,541	615,059
Total 1915-16	1,697,670	1,250,175	421,291	2,134,374	1,100,127
Increase	36,750	90,127	−77,710	−294,833	−485,068

Green-Fodder.—The cut of green feed is reported to have been 31,362 (52,809) tons. The principal crop was lucerne, which yielded 20,825 (40,313) tons.

Peas and Beans.—Although the yield of 101,267bush. was 94,304bush. less than in the record season of 1910-11, it was 42,797bush. more than last season. The average was 17.24 (14.37) bushels per acre.

The following is a summary of the yields and averages of the various crops in comparison with the previous season:—

Kind of Crop.	1916-17.		1915-16.		Increase.	
	Yield.	Avge.	Yield.	Avge.	Yield.	Avge.
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
CEREALS.						
Wheat	45,745,064	16·46	34,134,504	12·46	11,610,560	4·00
Barley—						
All kinds	1,734,420	16·74	1,697,670	20·00	36,750	−3·26
Malting	1,340,302	17·19	1,250,175	20·18	90,127	−2·99
Cape	343,581	15·72	421,291	19·91	−77,710	−4·19
Other	50,537	13·34	26,204	14·74	24,333	−1·40
Oats	1,839,541	12·13	2,134,374	16·87	−294,833	−4·74
Maize	993	8·49	15,837	22·56	−14,844	−14·07
Rye	11,346	6·07	30,658	11·06	−19,312	−4·99
Peas and beans	101,267	17·24	58,470	14·37	42,797	2·87
HAY.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
All kinds	615,059	1·27	1,100,127	1·55	−485,068	−0·28
Wheaten	436,813	1·35	754,516	1·58	−317,703	−0·23
Oaten	163,243	1·10	292,067	1·55	−128,824	−0·45
STRAW.						
All kinds	15,857	—	38,867	—	−23,010	—
Wheaten	8,440	—	24,578	—	−16,138	—

WHEAT PRODUCTION.

Decennial period, 1907-8 to 1916-17.

Notwithstanding the several exceptionally dry seasons which the State has experienced during the last decennial period, and the total general failure of the crop in 1914-15, it is satisfactory to note that an annual average of 23,020,474bush., equal to 10.46bush. per acre, was reaped, and 450,381 tons of hay, averaging 1.22 tons per acre, was cut. The recent record crop of 45,745,064bush. was produced on an average April-November rainfall of 18.87in. The average April-November rainfall for the 10 years over the agricultural areas was 13.66in. The two drought seasons of the period, 1913-14 and 1914-15, averaged respectively only 9.59in. and 6.87in.

The following statement gives the rainfall, acres sown, yield, and average per acre for each of the last 10 seasons, and the annual average for the period:—

Production Decennial Period, 1907-8 *to* 1916-17, *and Averages.*

Season.	Average Rainfall, April-Novem.	Total Area under Wheat (Grain, Hay, and Fed Off).	Wheat.		Wheaten Hay.	
			Production.	Average per Acre.	Production.	Average per Acre.
		Acres.	Bush.	Bush.	Tons.	Tons.
1907-8	14·15	2,025,901	19,135,557	10·91	315,857	1·17
1908-9	15·04	2,043,280	19,397,672	11·45	488,174	1·40
1909-10	17·78	2,216,397	25,133,851	13·26	439,469	1·38
1910-11	16·84	2,444,181	24,344,740	11·57	464,048	1·38
1911-12	10·48	2,607,206	20,352,720	9·29	475,782	1·18
1912-13	12·49	2,579,560	21,496,216	10·34	556,444	1·13
1913-14	8·59	2,699,632	16,936,988	7·47	418,972	1·02
1914-15	6·87	2,842,020	3,527,428	1·41	153,738	0·48
1915-16	14·48	3,220,645	34,134,504	12·46	754,516	1·58
1916-17	18·87	3,112,479	45,745,064	16·46	436,813	1·35
Av. for 10 yrs.	13·66	2,579,130	23,020,474	10·46	450,381	1·22

Similar details to the foregoing are shown in the following statement for each of the divisions of the State:—

Averages for Decennial Period, 1907-8 to 1916-17.

Division.	Total Area under Wheat (Grain, Hay, and Fed Off).	Wheat.		Wheaten Hay.	
		Yield.	Average.	Yield.	Average.
	Acres.	Bush.	Bush.	Tons.	Tons.
Central	830,648	7,177,116	11·06	231,715	1·29
Lower North	730,934	8,251,382	13·19	134,563	1·30
Upper North	318,617	2,605,027	9·27	40,778	1·12
South-Eastern	272,206	2,103,104	8·40	18,297	0·91
Western	426,339	2,881,959	7·31	24,983	0·81
Outside Counties	386	1,886	5·65	45	1·01
Total State	2,579,130	23,020,474	10·46	450,381	1·22

FIFTY YEARS' WHEAT PRODUCTION AND EXPORTS.

A review of the last 50 seasons shows that the State has produced an aggregate of 599,954,586bush. of wheat, averaging annually 11,999,082bush., or 7.51bush. per acre, and excluding the value of the exports to the other States since the year 1910, which have not been recorded, the total value of 50 years' exports of breadstuffs has aggregated £84,679,849, an annual average of £1,693,597.

The exports of breadstuffs for the 10½ years ended June 30th, 1917, totalled £32,137,811, an annual average of £3,060,744.

AREA SUITABLE FOR WHEAT-GROWING.

Of the area at present in occupation, the holders report that 12,569,000 acres are suitable for wheat cultivation.

NUMBER OF FARMERS.

Returns were collected this year from 17,451 farmers; of this number about 15,493 grew wheat for grain or hay, 4,067 barley, and 7,609 oats and oaten hay.

AGRICULTURAL MACHINERY.

Owned by Farmers.—In 1915-16 the value of machinery used chiefly in general agriculture was assessed by the owners at £2,782,423, an increase of £1,281,124 since 1907, the first year of assessment.

Factories and Works.—As intimately associated with agricultural production it is important to note that there are in the State 51 agricultural implement factories employing 900 hands and paying—in 1916-17—£108,430 in wages, with a gross output value of £287,434, the capital invested in such industry in buildings and plant being estimated at £141,642.

SEED WHEAT.

Sufficient information was collected from representative farmers in the various wheat hundreds of the State to enable a reliable calculation to be made of the average used for seed, and, as a result, the estimate to be used in future will be equal to 1bush. per acre. On this basis 2,643,000bush. have been used for the 1917-18 crop.

ARTIFICIAL MANURES.

96,893 (98,258) tons of artificial manures were used during the last season. Of the total area under various crops 2,856,787 (3,040,273) acres were treated with artificial manure to the extent of 76.0 (72.4) lbs. per acre. The area so treated was equal to 78.76 (80.78) per cent. of the total area cropped.

ADVISORY BOARD OF AGRICULTURE.

A meeting of the Advisory Board of Agriculture was held at the offices of the Department of Agriculture on Wednesday, November 14th. Mr. G. Jeffrey (Chairman) presided, and others present were:—Senator Colonel Rowell, C.B., Messrs. Laffer, M.P., F. Coleman, A. W. Shillabeer, J. Miller, and H. J. Finnis (Acting Secretary).

COMPULSORY SPRAYING AND SWABBING.

The Acting Secretary reported that the recommendation from the Waikerie Branch of the Bureau that the spraying and swabbing of vines and trees against insect and fungus pests should be made compulsory had been brought under the notice of the council of the South Australian Vinegrowers' Association, which had intimated that it approved of the proposal provided that it was applied only to the irrigation areas. It was felt that no harm would result from the enforcement of such a provision, but that much good might be accomplished. The Council added that if later it considered that the spraying and swabbing should be made compulsory over the whole State it would communicate with the Board to that effect. Mr. Laffer was surprised, in view of the generally dry conditions along the river, that the orchardists there should be troubled at all with fungus diseases. In the case of the vines he believed that in nine years out of 10 there would not be any necessity for swabbing. After further discussion it was decided to refer the matter to the next conference of the river Branches.

JETTY AND WHARFAGE TOLLS.

The Minister of Agriculture had intimated that in view of the financial position no action could be taken in regard to a recommendation that the jetty tolls imposed by the Government on Eyre's Peninsula and other ports should be abolished and maintenance met by direct taxation. Mr. Laffer expressed the opinion that the question merited the most careful consideration. The jetty tolls and wharfage, he said, pressed very heavily on many producers.

CORNSACKS.

It was announced that, following upon a recent inquiry respecting the supply of cornsacks for the forthcoming harvest, the Manager of the Wheat Harvest Board (Mr. Nicholls) had reported:—"So far as the Board is concerned, we may have 2,000 or 3,000 bales to spare when the reconditioning has been completed, but it is impossible to say yet. So far as I can ascertain from the brokers the South Australian merchants have bought sufficient cornsacks for a 25,000,000bush. harvest."

RIVER STEAMER.

The conference at Waikerie suggested that the Government should be asked to consider the question of providing a steamer on the River

Murray fitted up with a butter-making plant and cold store accommodation for butter, cheese, and other produce. The recommendation, with the sympathetic approval of the Board, was sent on to the Minister of Agriculture, who, it was announced by the Acting Secretary, had intimated that no action could be taken by the Government until the financial position improved.

WHEAT DESTRUCTION.

A protest from the Bute Branch against the loss on the wheat due to mice and rain being made a charge on the Wheat Pool, and a recommendation that the matter should be referred to the various Branches for an expression of opinion whether the loss should be met out of general revenue, were deemed to have a more or less political flavor, and therefore could not be considered.

MUSEUMS OF PESTS.

It was resolved to refer to the Government Horticultural Instructor (Mr. Quinn) a suggestion from the Ramco (River Murray) Branch that museums containing specimens of vine and fruit trees diseases and pests should be established on the irrigation areas, together with particulars of combative and remedial measures for the guidance of the settlers.

BACON-CURING.

A communication from the McNamara Bore Branch to the effect that the Government should be impressed with the desirableness of immediate action in connection withe the pig-raising industry, and the extension of the operations of the Government Produce Department to include bacon-curing and marketing, and the offering of financial assistance to any co-operative movement inaugurated for the purpose indicated was considered. It was determined that a report should be sought from the Manager of the Government Produce Department on the question of the suggested extension of the scope of the Department.

LIFE MEMBERSHIP.

The name of Mr. W. Pearson, of the Brinkley Branch, who had been an active member of the Bureau for close on 26 years, was added to the list of life members.

NEW BRANCHES.

Approval was given to the formation of the Riverton Women's Branch, with the following members:—Mesdames R. Wakeham, W. B. Davis, F. G. Hannaford, W. E. Bowden, R. J. James, W. Legoe, E. M. Gray, R. H Cooper, T. Camac, T. Longbottom, W. Hannaford, J. P. Schultz, M. Lock, F. Kschenka, A. W. Bowden, J. Hassel, A. E. Rowe, O. H. Castine, F. Phillips, A. L. Aland, J. Potter, A. S. Gillingham; Misses Dobbin, Hall, Longbottom, and D. Wakeham.

The Board also gave approval for the formation of a Branch at Talia, with the following foundation members:—Messrs. P. A. Thompson, F. L. G. Lewis, A. G. Dolphin, J. G. Dolphin, G. M. Lewis, A. G. Day, Thos. Little, P. G. Thompson, R. L. Thompson, and W. J. McBeath.

NEW MEMBERS.

The following names were added to the rolls of existing Branches:—Blyth—A. L. Halliday; Salisbury—F. W. Weston; Edillilie—E. DeBois; Carrow—W. Boyce, F. G. Woods, F. E. Prime; Bute—C. E. Green, Jas. Westlake; Wynarka—J. Nosworth, F. Nosworth; Colton—V. Lewis, F. Agars, J. North; Lenswood and Forest Range—J. Filsell, R. Green; Netherton—H. J. Godsen; Kybybolite—Geo. Bennet, A. Gibbs, jun., A. Weber; Wynarka—R. J. Chenoweth; Ramco—R. Rogers, Wm. Perry, Archie Toseland; Booleroo Centre—H. Sanders, Vin. Carey, Wm. Mills, H. A. Bauer; Wollowa—R. Rosenberg, V. Barnes, F. Sullivan; Longwood—W. P. Woolcock, Wm. H. Love; Minnipa—A. H. H. Ralph, J. H. Bates; Yeelanna—W. Habner, C. E. Wagner; Wepowie—F. Duffy; Redhill—F. R. Flavel; Warcowie—W. Crossman; Carrieton—T. W. Davill, M. F. Devitt; Tatiara—A. King; Morchard—P. H. Davill, C. P. Schulz, W. Higginson; Butler—J. C. Humphreys; Quorn—G. Easther, H. R. Fairweather; Tantanoola—Ed. Seebohm, F. McRostie, S. Dunn, W. McRostie, E. Morrison; Millicent—H. A. C. Day; Lucindale—S. Cotelle; Mount Remarkable—J. B. Onslow, T. W. Skinner, G. R. Crossing, H. H. Parker, D. M. McSweney, W. H. McGuire, C. M. Gooden, Kongorong—A. J. Ashby; Pompoota—H. Mitchell, W. Kirby, D. Dillon, J. P. O'Reilly, L. S. Pope, J. McNamara, N. E. Owens, G. Colquhoun, J. H. Buttfield, T. Draper, H. Miller, E. Rogers, F. T. Taylor, Warrow—R. Puckeridge, jun.; Mypolonga—Geo. Langley; Berri—C. Harris; Northfield—H. Clutterbuck; Port Broughton—W. C. Whittaker; Cherry Gardens—T. G. Scroop; Edillilie—M. Palm; Yaninee—F. Kirchner, W. J. Foster, E. Lund; Ramco—F. Hartwig; Tarcowie—R. H. D. Smith; Kalangadoo—W. H. Graney; Riverton—J. E. Kelly, Wm. Lock, A. S. Gillingham.

IMPORTS AND EXPORTS OF FRUIT, PLANTS, ETC.

During the month of October, 1917, 632bush. of fresh fruits, 5,514bush. of bananas, 17,129 bags of potatoes, 1,405 bags of onions, 4,995pkgs. of vegetables, 27pkgs. of trees, plants, &c., 207 empty wine casks, were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910. Eighteen packages of trees were fumigated. Under the Federal Commerce Act, 16,032pkgs. of dried fruit, 300 cases of citrus fruits, and 862pkgs. of honey were exported to oversea markets. These were consigned as follows:—For London, 15,588pkgs. of dried fruit and 862pkgs. of honey; for New Zealand, 444pkgs. of dried fruit and 300 cases of citrus fruit. Under the Federal Quarantine Act, 878pkgs. of seed, &c., were imported from oversea markets. During the month of November, 1917, 507bush. of fresh fruits, 11,286bush. of bananas, 9,225 bags of potatoes, 273bush. of cucumbers, 28pkgs. of plants, &c., 384 empty wine casks, and 60 empty cases were examined and admitted at Adelaide and Port Adelaide under the Vine, Fruit, and Vegetable Protection Acts of 1885 and 1910; 400bush. of bananas and 3bush. of cucumbers (overripe) were destroyed, and 25 empty wine casks, 60 empty cases, and 2pkgs. of plants were fumigated. Under the Federal Commerce Act, 6,500pkgs. of dried fruit, 423pkgs. of preserved fruit, 2,066 cases of citrus fruit, and 1pkg. of jam were exported to oversea markets. These were consigned as follows:—For London, 6pkgs. of dried fruit; for New Zealand, 6,494pkgs. of dried fruit, 403pkgs. of preserved fruit, and 2,066 cases of citrus fruit; for India and the East, 6 cases of dried fruit. Under the Federal Quarantine Act, 729pkgs. of seeds, &c., were examined and admitted from oversea markets; 112pkgs. of canary seed and 4pkgs. of cumin seed were cleaned and destroyed respectively on account of the presence of weed seeds, &c.

DAIRY AND FARM PRODUCE MARKETS.

A. W. Sandford & Co., Limited, report on December 1st:—

Butter.—Favorable weather conditions have been experienced throughout November, so that consignments of both butter and cream have come forward in good order. Local sales have been very active; any surplus being placed in cool stores on account of the Imperial Government. Values during the month have firmed, heavy business being put through in store and collectors' butters. Rates ruling at last auction of the month were:—"Alfa," 1s. 4d. per lb.; "Primus," 1s. 3d.; third-grade creamery, 1s. 1d. to 1s. 1½d.; choice separators and dairies, 1s. 1½d. to 1s. 2½d.; fair quality, 1s to 1s. 0½d.; store and collectors', 11½d. to 1s. 0½d. per lb.

Eggs.—Extensive quantities continued to come forward, and with weaker markets in the Eastern States, values here have eased in sympathy, and as Western Australia this season has been self-supporting, demand has not been too active. Hen eggs, 6d.; duck, 7d. per dozen.

Cheese.—Rates are lower, large parcels arriving from the South-East. However, most factories are now making large-sized cheese for the sale that has been made to the Imperial Government, and this will eventually put the market in a better position. Quotations:—8d. to 8¾d. per lb. for large to smaller sizes.

Honey.—No alteration to report in this line, prime samples being very scarce at 5d. per lb. A few lines of second-grade are coming to hand, which are finding slow sale. Beeswax now saleable at 2s. per lb.

Almonds.—Export buyers are offering advanced prices to secure requirements, but very few lots are offering. Brandis worth 1s. 1½d.; mixed softshells, 1s. 1d.; hardshells, 8d.; kernels, 2s. per lb.

Bacon.—Much heavier catalogues are being experienced in the live market, so that supplies of bacon are more plentiful, but as the Eastern States are operating here, market is kept nicely cleared. Hams are very saleable, the trade purchasing in view of the Christmas trade. Best factory-cured sides, 9½d. to 10½d.; hams, 1s. 2d. to 1s. 3d. per lb.

Live Poultry.—Large numbers have arrived throughout the month, but a large proportion were old hens and light-conditioned roosters, which had the effect of reducing values for this class, but birds fit to kill continue to sell at satisfactory prices. Heavy-weight table roosters, 3s. to 4s. each; nice-conditioned cockerels, 2s. 3d. to 3s.; plump hens, 2s. to 2s. 9d.; light sorts, lower; ducks, 2s. to 3s. 4d.; geese, 5s. 3d. to 5s. 9d.; pigeons, 8½d. each; turkeys from 8¼d. to 9½d. per lb. live weight for fair to good table birds.

Potatoes.—As a general rule in the month of November, the Adelaide market should be well supplied with locally grown new potatoes. This year, however, the early local crops have been very largely a failure owing to the ravages of Irish blight, and in consequence the market has been almost wholly supplied from the Ballarat district. Onions.—New locally-grown onions are coming forward in good quantities, and there is now scarcely any demand for old season's. Potatoes, £6 10s. to £7; onions (new season's), £10 to £12 per ton on trucks Mile End or Port Adelaide.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of and to the end of November, 1917, also the average precipitation to the end of November, 1917, and the average annual rainfall.

Station.	For Nov., 1917.	To end Nov., 1917.	Av'ge. to end Nov.	Av'ge. Annual Rainfall
FAR NORTH AND UPPER NORTH.				
Oodnadatta	0·50	9·51	4·47	4·76
Tarcoola	0·36	8·33	6·64	7·58
Hergott	0·49	9·92	5·38	6·04
Farina	0·37	7·19	5·94	6·70
Leigh's Creek	0·73	11·02	6·56	8·66
Beltana	0·44	11·27	9·18	9·22
Blinman	0·82	14·29	11·71	12·83
Hookina	0·76	22·83	10·40	—
Hawker	0·58	24·23	11·27	12·22
Wilson	0·34	20·63	10·93	11·78
Gordon	0·46	18·59	9·34	10·26
Quorn	0·86	17·72	12·94	13·78
Port Augusta	0·50	13·32	8·86	9·46
Port Augusta W.	0·58	14·15	8·62	9·36
Bruce	0·70	14·86	9·25	10·01
Hammond	0·46	19·52	10·52	11·46
Wilmington	0·41	22·75	17·16	18·26
Willowie	0·38	19·02	10·96	11·90
Melrose	1·09	36·34	21·99	23·04
Booleroo Centre	0·21	21·19	14·51	15·83
Port Germein	0·72	15·87	11·88	12·84
Wirrabara	0·59	30·64	18·21	18·91
Appila	0·58	18·90	13·86	15·08
Cradock	0·31	17·68	9·96	10·86
Carrieton	0·51	21·69	10·21	12·22
Johnburg	0·30	17·81	9·30	10·21
Eurelia	0·02	21·17	12·20	13·24
Orroroo	0·16	21·50	12·49	13·42
Black Rock	0·08	20·10	11·40	12·25
Petersburg	0·40	20·77	11·99	13·07
Yongala	0·39	23·28	13·01	13·94
NORTH-EAST.				
Ucolta	0·33	17·08	—	—
Nackara	0·44	17·10	8·94	—
Yunta	0·93	17·57	8·01	8·22
Waukaringa	0·44	14·25	7·17	7·94
Mannahill	0·75	12·72	7·69	8·46
Cockburn	2·51	14·78	9·06	7·97
Broken Hill, NSW	2·42	16·60	10·54	9·63
LOWER NORTH.				
Port Pirie	0·42	17·97	13·49	13·21
Port Broughton	0·64	17·07	15·61	14·33
Bute	2·44	23·95	14·78	15·42
Laura	0·46	24·39	17·26	18·22
Caltowie	0·84	22·04	16·03	17·27
Jamestown	0·91	25·45	19·37	17·46
Gladstone	0·85	23·54	15·05	16·00
Crystal Brook	0·24	21·09	14·80	15·62
Georgetown	1·12	28·19	17·19	18·32
Narridy	0·27	21·16	15·55	16·79
Redhill	0·31	23·63	15·82	16·79
LOWER NORTH—*continued.*				
Spalding	0·76	28·39	18·62	20·26
Gulnare	1·15	27·43	17·40	19·74
Bundaleer W. Wks.	0·62	27·73	15·90	17·29
Yacka	0·70	33·05	14·32	15·27
Koolunga	0·65	24·29	14·75	15·94
Snowtown	1·23	23·55	18·47	15·70
Brinkworth	0·89	24·93	15·27	15·48
Blyth	1·12	25·84	15·55	16·34
Clare	1·77	38·14	23·27	24·30
Mintaro Central	1·39	41·57	21·32	21·99
Watervale	1·86	42·07	25·99	27·17
Auburn	1·12	36·85	22·38	24·25
Hoyleton	2·15	25·18	16·88	17·96
Balaklava	1·16	19·11	15·01	16·03
Port Wakefield	1·24	17·80	12·53	13·13
Terowie	0·54	19·79	12·44	13·71
Yarcowie	0·69	22·28	12·94	13·91
Hallett	0·94	21·27	15·18	16·40
Mount Bryan	0·47	21·57	15·19	15·73
Burra	0·49	23·64	16·95	17·82
Farrell's Flat	0·83	25·83	17·88	18·87
WEST OF MURRAY RANGE.				
Manoora	1·20	29·46	17·13	18·09
Saddleworth	1·41	27·37	18·69	19·69
Marrabel	1·60	26·43	18·26	18·94
Riverton	1·62	30·90	19·66	20·48
Tarlee	1·22	24·32	16·29	17·48
Stockport	1·14	24·81	15·43	15·89
Hamley Bridge	1·22	20·18	15·62	16·45
Kapunda	1·27	26·15	18·86	19·67
Freeling	1·02	21·95	17·10	17·65
Greenock	1·10	26·82	22·62	21·46
Truro	1·48	29·31	19·06	19·74
Stockwell	1·11	26·26	18·28	20·30
Nuriootpa	1·24	25·44	20·05	21·25
Angaston	1·27	29·84	21·34	22·25
Tanunda	1·15	27·05	21·35	22·28
Lyndoch	0·94	29·02	21·89	23·01
Williamstown	1·29	—	—	—
ADELAIDE PLAINS.				
Mallala	0·91	18·09	15·99	16·88
Roseworthy	1·08	21·60	16·61	17·31
Gawler	0·73	23·76	18·32	19·21
Two Wells	0·85	14·93	15·32	16·36
Virginia	1·12	21·16	16·54	17·58
Smithfield	0·81	23·00	16·28	17·30
Salisbury	1·01	24·52	17·60	18·57
North Adelaide	1·44	33·35	21·48	21·49
Adelaide	1·15	27·86	20·10	21·04
Brighton	0·62	37·58	19·89	—
Glenelg	0·74	25·55	17·37	—
Magill	1·16	36·85	24·10	19·93

RAINFALL—*continued.*

Station.	For Nov., 1917.	To end Nov., 1917.	Av'ge. to end Nov.	Av'ge. Annual Rainfall
ADELAIDE PLAINS—*continued.*				
Glen Osmond	1·00	38·43	24·22	25·26
Mitcham	1·05	32·05	22·44	23·47
Belair	1·23	—	27·20	28·64
MOUNT LOFTY RANGES.				
Teatree Gully	2·00	40·58	26·50	28·19
Stirling West	1·88	70·46	44·47	46·70
Uraidla	1·87	67·69	42·22	44·35
Clarendon	0·95	42·01	31·78	33·67
Morphett Vale	0·50	29·74	20·90	23·32
Noarlunga	0·41	27·93	19·25	20·28
Willunga	0·94	34·40	24·81	25·98
Aldinga	0·37	28·69	19·15	20·34
Normanville	0·57	26·89	19·67	20·65
Yankalilla	0·77	32·57	33·58	22·78
Cape Jervis	—	—	—	16·34
Mount Pleasant	1·58	26·02	25·80	26·87
Blumberg	1·23	27·78	28·03	29·38
Gumeracha	1·47	30·81	31·06	33·30
Lobethal	1·65	33·84	33·83	35·38
Woodside	1·56	30·49	30·51	31·87
Hahndorf	1·49	33·10	33·32	35·45
Nairne	1·35	27·18	23·70	28·83
Mount Barker	1·99	30·18	29·69	30·93
Echunga	2·10	31·99	31·50	32·83
Macclesfield	2·01	29·66	29·38	30·72
Meadows	2·85	35·13	34·28	35·52
Strathalbyn	1·55	18·96	18·45	19·28
Myponga	0·85	—	—	—
Millbrook Reservr.	1·28	—	—	—
MURRAY FLATS AND VALLEY.				
Wellington	0·76	16·82	14·05	15·01
Milang	1·11	15·50	15·00	16·08
Langhorne's Brdg	0·95	—	—	15·27
Tailem Bend	0·64	17·93	13·82	—
Murray Bridge	0·82	14·82	13·36	14·32
Callington	0·67	19·16	14·75	15·65
Mannum	0·64	11·99	11·02	11·67
Palmer	0·63	19·42	13·97	15·60
Sedan	2·12	17·29	11·43	11·92
Blanchetown	0·39	6·97	10·55	—
Eudunda	1·79	21·53	16·60	17·33
Sutherlands	1·42	13·39	10·12	10·71
Morgan	1·14	10·70	8·44	10·60
Overland Corner	0·79	12·80	10·38	—
Renmark	0·89	16·05	10·01	11·42
Loxton	1·01	18·22	10·20	10·93
Swan Reach	0·57	—	—	—
Waikerie	1·12	—	—	—
WEST OF SPENCER'S GULF.				
Eucla	1·09	11·41	9·51	10 13
White Well	0·96	11·22	8·71	9·67
Fowler's Bay	0·63	16·42	11·80	12·11
Penong	0·98	16·65	10·95	11·93
Murat Bay	0·58	14·29	10·12	—
Smoky Bay	0·29	14·03	—	—
Streaky Bay	0·46	20·02	14·68	15·31

Station.	For Nov., 1917.	To end Nov., 1917.	Av'ge. to end Nov.	Av'ge. Annual Rainfall
WEST OF SPENCER'S GULF—*continued.*				
Port Elliston	0·39	23·55	15·79	16·49
Port Lincoln	0·98	19·79	17·09	19·88
Tumby Bay	0·82	18·85	14·83	15·00
Carrow	2·74	27·41	—	—
Cowell	0·50	12·29	—	11·76
Point Lowly	1·13	14·89	11·09	12·21
Cummins	0·37	—	—	—
Arno Bay	0·51	—	—	—
YORKE'S PENINSULA.				
Wallaroo	0·81	17·44	13·52	14·05
Kadina	1·02	22·91	14·25	15·88
Moonta	0·63	19·90	14·96	15·22
Green's Plains	0·83	20·87	15·11	15·73
Maitland	0·49	27·20	19·41	20·08
Ardrossan	0·49	16·61	13·32	13·89
Port Victoria	0·55	21·43	14·67	15·21
Curramulka	0·35	22·42	17·80	18·50
Minlaton	1·03	27·03	16·96	17·41
Stansbury	0·76	27·03	16·42	17·06
Warooka	0·68	27·31	17·00	17·71
Yorketown	0·96	24·61	16·68	17·47
Edithburgh	1·11	24·25	15·91	16·48
SOUTH AND SOUTH-EAST.				
Cape Borda	0·68	29·69	24·11	25·09
Kingscote	1·22	25·54	18·06	18·95
Penneshaw	1·07	23·05	20·52	21·34
Cape Willoughby	—	—	18·91	19·69
Victor Harbor	0·84	26·31	20·78	22·18
Port Elliot	1·12	24·88	19·18	20·33
Goolwa	0·70	23·26	26·10	17·93
Pinnaroo	2·85	19·55	16·59	16·74
Parilla	2·67	19·05	—	—
Lameroo	2·57	19·85	15·47	16·55
Parrakie	2·18	18·57	13·43	—
Geranium	2·33	22·08	—	—
Peake	1·72	20·96	15·23	—
Cooke's Plains	0·90	20·55	14·02	14·74
Meningie	0·90	23·55	—	—
Coomandook	1·46	24·38	16·62	16·80
Coonalpyn	0·98	24·19	16·53	17·49
Tintinara	1·90	25·50	17·32	18·78
Keith	2·16	23·89	17·34	—
Bordertown	1·18	24·85	18·33	19·76
Wolseley	1·14	24·57	16·86	17·72
Frances	1·00	22·09	18·92	20·74
Naracoorte	1·32	27·18	21·38	22·60
Penola	1·27	31·60	24·06	26·78
Lucindale	0·75	27·27	21·68	23·32
Kingston	1·07	31·29	23·19	24·73
Robe	1·30	29·82	23·48	24·69
Beachport	1·66	30·43	26·12	27·51
Millicent	1·64	33·79	26·93	29·25
Mount Gambier	1·52	33·64	29·92	32·00
C. Nrthumberland	—	—	35·96	26·63
Kalangadoo	1·58	—	—	—

WOMEN'S BRANCHES OF THE AGRICULTURAL BUREAU.

THE FIRST BRANCH FORMED.

The extension of the Agricultural Bureau system, of which this State has now had nearly 30 years' experience, to include women's branches, suggests itself as a natural development. There are many branches of agriculture in which the woman on the farm plays a part equally as important as that played by the farmer himself, and the expert officers of the Department of Agriculture have not failed to recognise the fact that in many ways their efforts are likely to be more fruitful if they are in a position to bring the work of the respective branches directly to the notice of the women. More particularly does this apply in the cases of dairying, horticulture, poultry-raising, &c. The question of the economies of the home, too, is one to which the attention of women on the farm might be directed with profit. Is it too much to expect that the more enlightened management of the household of the farm will do much to counteract the attraction of the city for the young life, and turn the tide of migration from the farm to the factory back to a healthier and undoubtedly happier sphere?

THE FIRST WOMEN'S BRANCH.

The first women's branch of the Bureau was inaugurated at Riverton on Friday, October 19th. On this occasion an address was delivered by the Acting Secretary of the Advisory Board of Agriculture (Mr. Harold J. Finnis), in the course of which he explained that approval had been given to the association of women interested in agricultural matters under the auspices of the Advisory Board of Agriculture wherever conditions permitted of it. Whilst it was recognised that no locality of the State should ultimately be shut out from the scheme, it was thought wise that the earlier branches should be formed in the immediate neighborhood of existing branches of the Agricultural Bureau. By mutual consent, joint meetings of the women's and men's branches could be held from time to time. It was also mentioned that as soon as a sufficient number of women's branches had been formed, the question of throwing open the columns of the *Journal of Agriculture* to questions of domestic economy and matters in which women were especially interested would be considered. The rules governing the institution were then explained, and a constitution for the branch suggested.

Subsequently it was decided that a branch should be formed, and the following officers were elected:—President, Mrs. R. Wakeham; Vice-President, Mrs. T. Longbottom; Hon. Secretary, Mrs. E. M. Gray. The members are—Mesdames W. B. Davis, F. G. Hannaford, M. E. Bowden, R. J. James, W. Legoe, W. Hannaford, J. P. Schulz, W. Lock, F. Kschenka, A. W. Bowden, R. H. Cooper, T. Camac, J. Hassel, A. E. Rowe, A. H. Castine, F. Phillips, A. L. Aland, J. Potter, A. S. Gillingham, Misses Dobbin, Hall, Longbottom, and D. Wakeham.

The Agricultural Bureau.—Members of the First Women's Branch.

THE AGRICULTURAL OUTLOOK.

REPORT FOR THE MONTH OF NOVEMBER.

The following reports on the general agricultural condition and outlook of the areas represented by the Government Experimental farms mentioned below have been prepared by the respective managers:—

Booborowie.—Weather—The first half of the month was fine and warm, which was followed by thunderstorms and heavy falls of rain. Towards the end of the month the weather was hot, with one day of hot winds. Crops have improved wonderfully, especially the late and stubble crops. Those on the wet flats are making heavy hay crops. Natural feed is good, and keeping green for a long time compared with most years. Stock are in good condition; several deaths have been caused by bloodworms amongst horses. Pests—Rabbits and sparrows are doing much damage.—Miscellaneous—Haymaking has started amongst some of the early varieties of wheat.

Eyre's Peninsula.—Weather had been fine and comparatively calm until the 20th instant, when good steady rain set in, registering 140 points. This was followed by some fairly strong wind, which laid the crops somewhat badly in places. One spell of real warm weather was experienced during the first week of the month, and crops were ripening off quickly when cooler conditions intervened. Harvesting of some of the early crops was commenced early in the month, and most of the crops are too near maturity to benefit much by the late rain. Red rust is plentiful in places, and yields on the whole are not expected to be so high as those of last year. The grain harvested to date is a little pinched. There is still a good quantity of hay in the paddocks. Pests—Mice are more noticeable of late. Rabbits are maintaining their own, although the poison cart has been much in use during the month.

Kybybolite.—Weather—Fine and warm during the first three weeks, followed by a week of wet weather, when 209 points of rain fell. Crops have improved somewhat this month, and are maturing quickly, but no hay has been cut as yet; the rain acted as a check, and saved them going off too fast, especially the fairly large proportion of late-sown. Barley sown in October will now probably give a fair yield, as also will peas sown in September and October. Summer crops are greatly benefited by the rains, and good returns are assured, providing they are properly worked. Natural feed is drying off, but is more abundant than ever. Stock are in very good condition. Wool returns are above the average in quality and quantity. Miscellaneous—Fallowing operations have been completed, the area so treated being much smaller than usual. The time during which this operation was possible has this year been very limited, and the poor results showing in the present crops have had an influence in reducing the area.

Turretfield.—Weather conditions during November were fine, with mild temperatures; one thunderstorm was experienced, and the rainfall registered was 124 points. Crops have improved during the month, and the rain recorded in November will further benefit the late crops. Haymaking has been general, and wheat crops are beginning to turn color. So far red rust has not done any material damage. Natural feed is dying off, but plentiful. Stock are in splendid condition. Pests—A few foxes have been noticed in the district.

Veitch.—Weather—172 points of rain have fallen during the month; average for same month, 107 points. Crops are all satisfactory. Early sown wheats are now being harvested, and yielding a good sample. Late sown fields will benefit with this month's rain, and should now finish well. Natural feed is now drying off. Stock are all in good healthy condition. Pests—Rabbits are still troublesome, and need attention. Miscellaneous—Haymaking operations are finished on most farms in the district, and preparations for the grain harvest are now going ahead.

AGRICULTURAL BUREAU REPORTS.

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*No report received during the month of November. † Formal report only received.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

UPPER-NORTH DISTRICT.

(PETERSBURG AND NORTHWARD)

ARDEN VALE AND WYACCA (Average annual rainfall, 16.65in.).

October 29th.—Present: six members.

Wheat Most Suitable for Hay and Time to Cut.—The Hon. Secretary (Mr. P. O. Eckert) said Federation was a good hay wheat, but it did not always grow to a good height. Golden Drop was not so good as Federation, but it was an early variety and grew fairly tall. Yandilla King was a heavy wheat, and one that had a good grain. Wheat should be cut for hay when there was a fair amount of grain in the head, not when it was too far forward, as there would not be so much nourishment in the straw. The election of officers also took place.

MORCHARD (Average annual rainfall, 11in to 12in.).

September 29th.—Present: 14 members and one visitor.

Binder and Header Thrasher v. Harvester.—Mr. C. Schulz, in dealing with this subject, gave preference to the use of the binder and thrasher, because of the straw that could be saved and stored for use during bad seasons. In discussing the paper, Mr. H. Toop spoke in favor of the harvester. Mr. Jasper said that by using the binder, one could commence harvesting from five to eight days earlier than with the harvester. Once the crop was cut and stooked, it would stand a lot of rain and bad weather and could remain in the field until all other harvest work was finished. The headed and thrashed straw was very often better than so called hay. The headed straw could be put by for bad seasons or could be fed to stock at any time, and would return a fair profit. Mr. H. A. Tillbrook said that by using the binder and thrasher in good seasons the straw could be stacked, which would be a big help to the farmer in the North during bad seasons. Mr. J. W. Rechstein favored the binder and thrasher. The straw could be kept for a long period if it was well covered, and the mice would not be so likely to damage the stack. Mr. Geo. Gregory said that some provision should be made for dry seasons, and on that account he advised members to use the binder and thrasher and stack the straw. Mr. J. W. Rechstein read an extract from the *Journal* on "Sheep-dipping," which was well discussed. The report of the delegates to Congress and the visit to Roseworthy was received and discussed. Mr. Rechstein tabled a specimen of wild clover.

ORROROO (Average annual rainfall, 13.42in.).

Present: nine members.

The Rabbit Pest.—Under this title a paper was contributed by Mr. L. R. Cottrell, who said that rabbits were steadily pushing their way into all parts of this continent. He had visited northern New South Wales during 1914, and had noticed the damage they were doing there. He was convinced that the late drought, bad as it had been, would not have been so disastrous to stock had it not been for the amount of feed eaten by the rabbits. Unless some feasible scheme was formulated to keep the pest wthin bounds, the whole of pastoral Australia would slowly deteriorate and never again retain its former stock-carrying capacity.

It would be difficult to try and form any estimate of the amount of damage caused by the pest, but if one took into consideration the wages paid, the loss of stock and the many hundreds of acres of land that had been cultivated and were not worth harvesting, it would come to a large sum of money. There were two sides of the question to be studied. Should the rabbit be considered a pest to be ruthlessly exterminated, or should it be regarded as a food which could be profitably utilised? Personally, he did not believe it would ever be possible to exterminate the pest altogether. Some years ago it was proposed to introduce a disease that would spread amongst the rabbits and kill them out. Experiments of that kind would need to be very carefully handled, and he had grave doubts as to the wisdom of such a proceeding being a success. If such experiments were successful, it should be borne in mind that the export trade in tinned and frozen rabbits would cease, and a certain amount of revenue be lost. Even where rabbits were frozen or canned the ultimate results were not so good as it would be from either agricultural or pastoral products. The large areas infested with the pest beyond railway stations made it impossible to turn the rabbit into a product for consumption. The only course in such places was to adopt any of the various methods used in destroying them. Some people thought the fox should not be killed on account of the number of rabbits he killed, but the fact should be borne in mind that if the rabbits were reduced, the fox would soon turn his attention to lambs and poultry yards. During the drought many of the pests were considerably decreased in number, but with the advent of better seasons, both seemed to return in larger numbers than before. He maintained that by keeping the rabbits in check, foxes would also be reduced. It should be remembered that during the summer months the rabbits would readily take poisoned paits. These could be purchased with very little expense and labor. It was not a difficult matter to keep them in check in settled districts, but out in the back country where there were only a few settlers they were rarely, if ever, disturbed. Where it was possible, he strongly advised the digging out of the warrens and filling them in, because where the burrows were closed the dogs were able to destroy a great many more. Fumigation was also another successful method adopted by many people. He had obtained best results by the use of poisoned baits made about the size of a pigeon's egg and mixed with pollard to which a little arsenic and sugar had been added. These were inserted into the burrow and the hole was then filled in. It was a mistake to think that an occasional raid would rid one's property of the pest; only a constant, vigorous, and united campaign would effectively eradicate the rabbit pest.

TARCOWIE (Average annual rainfall, 15½in.).

October 30th.—Present: 14 members and one visitor.

Disc Cultivator.—In a short paper dealing with this question the Hon. Secretary (Mr. W. S. Ninnes) said there were many arguments for and against the use of the disc cultivator. Provided the machine was worked in dry fallow one would obtain good results, such as preparing a fine seed bed and killing the weeds; but when the land was wet and sticky the implement was practically of no use. Another disadvantage of that type of machine was that it was of very heavy draught in hard or wet land. His experience had proved that the soil in the district was not suitable for the use of the twin disc cultivator. Mr. J. P. Smith was of the opinion that the disc implement did not turn the subsoil under and was too heavy in draught. Mr. T. Ninnes thought that a machine of 10 discs did good work. Messrs. J. Symons and T. Muller preferred the use of the share cultivator.

WEPOWIE (Average annual rainfall, 13in. to 14in.).

October 27th.—Present: 13 members and one visitor.

Handling and Breaking in a Colt.—Mr. M. M. Irvine, in a paper dealing with this question, said a small yard should be formed close to the stable, and in order to get the colt accustomed to being handled a light stick should be rubbed over its back and neck. The animal should next be taught to tie up, and for that purpose he recommended the use of a strong rope, which could be slipped, with the aid of a stick, over the colt's head. The winkers could be put on by undoing the bit strap and working them along over the neck and ears, when the throat strap could be buckled and the bit put into the horse's mouth. Before taking the colt out of the yard he advised coupling it to a quiet horse. After working in that manner the colt should be harnessed to a light log. He preferred working the young horse in a tandem team, as that enabled one to tie the neck rope to the leader chain, which prevented the colt from running back. Care should be taken to see that the animal worked in a good fitting collar as there was a tendency for the shoulders to scald, and if that happened the horse would in all probability suffer from sore shoulders.

AMYTON, October 31st.—The Hon. Secretary (Mr. T. Ward) read an extract from a bulletin dealing with "Sheep on the Farm."

EURELIA, November 9th.—Mr. W. H. Shephard, in a short paper dealing with the "Care of Horses' Shoulders," said when the horses were being worked at fallowing time and they did not take well to dry feed, there was a danger of their shoulders becoming sore. To prevent that it should be seen that the collars were kept clean and the chains of an even length. After a short discussion on the question, Mr. M. P. Daly gave a report of the recent Congress proceedings.

HOOKINA, October 30th.—The pamphlet on "Smut in Wheat" (issued by the Department of Agriculture) was read by a member, and a good discussion followed. The Branch delegates reported on the Adelaide Congress.

WILMINGTON, October 31st.—Mr. T. D. Peek read a short paper entitled "Observations," and after dealing with various question he advised members to devote more time and energy to the production of side lines on the farm.

MIDDLE-NORTH DISTRICT.

(PETERSBURG TO FARRELL'S FLAT.)

BEETALOO (Average annual rainfall, 18in. to 19in.).

October 22nd.—Present: nine members.

Sheep most suitable for District.—A paper dealing with this question was contributed by Mr. A. H. Clogg, who gave preference to the Merino sheep if kept for the purpose of wool-growing. They were of a strong constitution, which was a strong point in their favor, as feed in that district was as a rule rather late. The Lincoln-Merino cross also did well, and the lambs grew very quickly. They also grew a fairly coarse and strong wool. Some people did not favor crossbreds because they were bad fencers, but he thought that if the fences were kept in good order no trouble would be experienced.

Vegetable growing.—In a paper dealing with this subject Mr. J. Burton said deep, light, loamy soil would give best results for the cultivation of vegetables. Care should be taken not to work that class of soil when it was very wet. The land should be dug to a full spade's depth and left in lumps exposed to the wind, sun, and rain to allow it to mellow, especially if rotted stable manure had been applied. The ground should be thoroughly soaked with water in order to encourage the roots to go deeply into the soil, and then hoed or worked with a hand cultivator. Well rotted stable manure was the best to apply to the plants, but if that could not be obtained artificial manure made a good substitute. Liquid manure could be made from any of the soluble fertilizers or from horse, cow, or fowl manure mixed with water. As fowl manure was very strong it should only be applied in small quantities. For raising early cucumbers, marrows, and tomatoes hot beds were required. These were made by procuring enough fresh stable manure to make a heap 2ft. or 3ft. high, and large enough to carry the frame. The manure should be firmly trodden down and a layer of about 6in. of soil put on the top. After the plants had a fair start they could be exposed on fine days. Transplanting should only be done during cloudy or dull weather. It was not advisable to sow the same crops on the same ground two years in succession. Root crops should follow such plants as cabbages or cauliflowers. Fresh manure should not be applied to land intended for root crops, as that would result in forked and irregular shaped roots. Cabbages, cauliflowers, and rhubarb required a very heavy dressing of manure. Carrots, parsnips, and beetroot planted in soil of a light sandy loam would give good results. Peas and beans should be planted, both early and late sorts. The plot for celery should be made as rich as possible by digging in a large quantity of rotted manure, to which a sprinkling of artificial manure could be added. A good plan was to plant the lettuce between the rows of cabbages and cauliflowers. He advised the early planting of water, pie, and sweet melon seeds. Onions should be planted out in June, and the ground kept free from weeds. If planted in August and February potatoes would give good results. Tomato seeds should be sown during July. He preferred growing turnips as an autumn crop with superphosphate as the best manure.

GLADSTONE (Average annual rainfall, 16in.).

October 6th.—Present: 14 members.

Sheep Breeding v. Dealing.—Under this title a paper was read by Mr. R. E. Lines, who said that more sheep should be kept on the farm. Not only did they provide the homestead with a supply of meat, but the income to be derived from the lambs and wool, from ruling prices, would be a valuable source of revenue. From experience he was able to state that when feed was scarce sheep did well if fed on hay chaff. As a rule the dealer did not tend to build up the standard of the sheep, as he was not careful to select a good type of ram for mating with the ewes. He recommended the Lincoln or Lincoln-Merino cross ewe mated to a Shropshire or Dorset ram. Members discussed the paper and generally agreed with the views expressed by the speaker. Messrs. Black and Mutter delivered a report on the Annual Congress. At a meeting held on October 27th, Messrs. F. Mutter and E. T. Hollitt read the papers dealing with "Fodder Crops in the Mallee" and "The Fox and How to Contend Against Him," which were read at Congress.

LAURA.

October 30th.—Present: 11 members.

The Benefits of the Agricultural Bureau.—Mr. W. Stevens, in speaking on this subject, spoke in high terms of the services that were rendered to those engaged in agricultural pursuits by the Agricultural Bureau. The meeting together of so many producers in each district and the discussion of subjects of timely interest did a great deal in forwarding the progress of agriculture and production. The members of the various Bureaus situated in almost every part of the State could at all times obtain the advice of the expert officers of the department free of charge. It was also a means of bringing together that class of men who were desirous of educating themselves for their mutual benefit. Through the medium of the *Journal* questions relating to stock, poultry, horticulture, &c., were dealt with. In concluding, Mr. Stevens urged members to do their utmost to awaken and to take a lively interest in the workings of the Bureau.

MUNDOORA (Average annual rainfall, 14.11in.).

October 29th.—Present: 13 members.

Most Profitable Horse to Breed on the Farm.—Mr. C. H. Button, in a short paper under this heading, gave first place to the Clydesdale. He thought the Shire horse had too much bone and hair. The Clydesdale was an active horse, and if bred to a fair type of farm mare good working horses would result. For light work the Blood horse crossed with an ordinary light mare would give a very useful horse, and one that could be used either for trap or saddle work.

BOOLEROO CENTRE, October 26th.—Mr. W. A. Nottle contributed a paper, in which he dealt with the question of taxation.

CRYSTAL BROOK, October 27th.—Mr. A. J. Green delivered an address on "The Hogan Test for Poultry."

GEORGETOWN, October 29th.—Mr. M. A. Hin gave a detailed account of a visit to the recent agricultural show in Melbourne, and the Hon. Secretary (Mr. S. Eyre), delegate to the Annual Congress delivered his report.

LAURA, September 28th.—The Wool Instructor (Mr. Henshaw Jackson) gave a demonstration of wool-classing at Mr. E. Pech's farm, and in the evening delivered an address on "Sheep-farming."

NORTH BOOBOROWIE, September 19th.—The Veterinary Lecturer (Mr. F. E. Place) gave a practical demonstration of castration, and in the evening delivered an address on "Milk Fever."

WHYTE-YARCOWIE, October 25th.—The Wool Instructor (Mr. Henshaw Jackson) gave a demonstration of "Wool-classing" at Mr. J. McGregor's sheds, and in the evening delivered an address on the value of "Sheep on the Farm."

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT)

CLARE (Average annual rainfall, 24.30in.).

November 17th.

In the presence of 17 members and nine visitors the Hon. Secretary (Mr. R. E. Hunter) delivered an address dealing with the suggestions of the Berri Branch in regard to the marketing of Australian fruit, and he also explained the proposals of the Government Produce Department for the marketing of the apple crop. Mr. J. H. Knappstein also explained a number of points dealing with the matter, and replied to questions submitted. A good discussion, in which Messrs. Duke, W. Pattullo, C. T. Jarman, and Hicks took part, resulted.

LONE PINE.

November 6th.—Present: 24 members and nine visitors.

Dairying.—Mr. A. Hoklas, in reading a paper dealing with this question, said it was most essential to purchase good cows. The Jersey was recommended as the best cow for butter, but he was of the opinion that when dairying was carried on as a side line and one was not able to devote a great deal of time to the cows, the Jersey-Shorthorn cross would be found a much hardier type of cow and one that did not need so much care and attention as the pure-bred animal. The type of animal preferred was one on which the udder was set well forward and square at the back, with fair sized teats that were easy to milk. If the animals were allowed to have a frequent change of pasture the grass would keep much sweeter. He was in favor of feeding the cows whilst they were being milked, and he contended that if that plan were adopted the animals would stand more contentedly and give down their milk more freely. If possible they should also have access to a good supply of fresh water. On no account should the cows be rushed in from the paddock to the milking yard, but be walked in quietly and allowed to settle down before being milked. Cleanliness was one of the main principles of the success of dairying, and for that reason he advised the washing of the teats and udder. The milker's hands should also be washed after each cow had been milked. If that plan were adopted he thought much of the trouble with sore teats would be prevented. No cow should be milked for at least four days after calving. When separating, one should endeavor to keep the milk up to a temperature of 90deg. to 95deg. The machine should be kept very clean, and when separating was finished a half a gallon of separated milk run through the machine would rinse out any cream that might be left. Cream was easily contaminated by the smell of other articles such as cheese, meat, fruit, &c., and for that reason it should be kept in a cool place by itself. The cream could be kept cool in summer by tying a wet corn sack around the outside of the can.

NANTAWARRA (Average annual rainfall, 15.90in.).

October 25th.—Present: 10 members.

Noxious Weeds.—In opening a discussion on this subject Mr. S. Steck said he had noticed one or two new weeds about the district. He contended that farmers did not exercise enough care in dealing with noxious weeds when they first made an appearance. Mr. A. F. Herbert, in speaking of the wild turnip, said the spread of that weed would be greatly minimised if it were destroyed for some distance inside fences and along the sides of the roads. Mr. W. Smith said the thistle mentioned by Mr. Sleep grew in some of the eastern districts, but was not a very difficult one to eradicate. He had known the second thistle for a number of years, but they had not been troublesome until the present season. The wild turnip was a weed that he had been fighting for many years, and he had found it most annoying that while he endeavored to keep his land clean other people were not so particular. Like Mr. Sleep he was inclined to favor a special rate for their destruction. Mr. W. Greenshields favored the plan of fallowing the land and keeping the weeds in check with sheep. Mr. P. Nottle said the wild turnip was a weed that spread very rapidly, and considered that more stringent steps should be taken to deal with it. Mr. R. P. Uphill thought the enforcement of a tax to destroy wild turnip would do more harm than good, in that it would drive many people off the land. Mr. F. J. Sutton noticed that the weed was gradually working south, and like Mr. Uphill, thought the enforcement of law would be too drastic a step.

RIVERTON (LADIES') (Average annual rainfall, 20.48in.).

October 30th.—Present: 22 members.

Beautifying the Home.—In a paper under this heading Mrs. T. Longbottom said:—"In dealing with the problem of beautifying the home I intend first dealing with the protection that is necessary for a garden. The first factor in planning is to have a strong fence, which will make convenient shelter for flowers, as plants of any sort never grow well if constantly battered with strong winds. Bushy trees grown farther away from the garden on the north side, also on the west, give a good shelter, as winds from those directions do the most damage. Before laying out the garden, plan out the manner in which you would like the flower beds situated, and take care to have them even. The footpaths should be not less than 3ft. wide. If flower beds are small, they are more convenient for working, and it will not be necessary to tread on the beds, as it helps to harden the ground, which should be soft and loose. If the soil is not suitable, it should be taken out 18in. deep, and replaced by good soil mixed with sand and well-rotted manure. If there is sufficient ground available, a lawn or two adds to its beauty and neatness. Anyone not having much spare time for gardening can make the place look attractive by having pretty flowering shrubs, as they take up the space, and do away with the labor that annual plants necessitate. Every garden should have roses, and care should be taken to select those that flower most of the year round. A few of the best-flowering standard roses are:—Exquisite, Hugh Watson, Hugh Dickson; for climbing roses I would suggest the following:—Cloth of Gold, Belle Siebrecht, and William Allen Richardson. If the blooms are kept cut, either fresh or dried, it helps greatly to increase the flowering. With regard to pruning roses, I would suggest doing a few at different times, which will enable you to have roses blooming all the time. Purchasing roses already grafted will be found expensive. I have grown some nice standards from cuttings, and find they grow as well as the briar standards. The Bride is one of the easiest roses to grow. When planting annuals to make an attractive show, it is best to have them planted in groups, and if the beds are small, only one kind in each. All bulbs should have a bed to themselves. When the foliage dies the bulbs should be taken up and stored away till April. It is to the advantage of all persons who are lovers of pot plants to have a flower house, even if it is only the end of a verandah enclosed, because ferns and begonias never thrive or grow so finely as when grown in a glass house, which must have air, but be free of draughts. I will finish my paper on the practical sort of a garden one should have. However rich or poor, it is always nice to be able to go into your own garden and cut the vegetables you require for your household use, which can easily be done with a little attention. To plant a few at different times is best, as then they will not all come in together. As to watering of vegetables and flowers in the summer, it is better to give them a good watering once or twice a week than a light sprinkling every night. Care should be taken not to wet the leaves, as the sun scorches them easily."

ROSENTHAL.

October 31st.—Present: 25 members and three visitors.

Colt-breaking.—In a paper dealing with this question, Mr. C. W. Hoffmann said one should commence to handle a foal two or three days after it was born.

The foal should be weaned when about five months old and kept away from its mother. It was essential that the foal, when being weaned, should be well fed and cared for. It was not wise to allow the foal to have water in the loose box, but if a halter were placed on him he could be led out for a drink two or three times a day. It was well to remember to treat the colt with all kindness at that stage of his life. After about six weeks he could be turned out with the other stock, providing the weather was not too cold, when it would be better to put him back into the loose box for the night. At three years of age, he should be caught and properly broken in. The first lesson the colt should learn was that he had to do as he was told. If he did wrong he should be punished for it, but the writer of the paper urged members not to be constantly using the whip. There was a difference between being determined and being cruel towards the animal. All tackling used in breaking in should be of the best quality no matter how quiet the animal might be. The winkers should be put on, and after being led about for awhile, he could be coupled to a quiet horse and mouthed. Next, a collar could be put on and a pair of leather traces, and a log hitched on. That could be done for a couple of hours the first day, and the time of work and weight of the log gradually extended as the colt improved. He should be worked in such implements as a plough or cultivator where there was very little chance of his being hurt. He thought it always advisable to work the colt in an open bridle until thoroughly broken in. Different methods should be employed when one had a station bred colt to break in, and the best method of catching the young horse was by means of a crush pen. Winkers and mouthing tackling should first of all be put on, and after the colt was allowed out of the pen for awhile, one should endeavor to get the confidence of the animal. If he showed vice he should be punished, but care should be taken to do so in moderation.

Care of Horses.—In a paper on this question, Mr. F. H. Wolf said the development of motor power had, to a large extent, dispensed with the use of the horses, but there were many classes of work that could not be carried on without the services of that useful animal. In caring for the horse, first consideration should be given to the erection of a stable which should be closed in on three sides, and have the open side facing the east or north-east, as it was very seldom that rough weather came from that quarter in the vicinity of Rosenthal. The iron roof was in many ways preferable to straw. There was not so much danger of fire, and gutters could be attached and a good supply of water would be conserved provided tanks were erected. The advantage of the straw roof was that it was cool in summer and warm in winter, but they were a continual source of trouble on account of the wind blowing the straw about. He much preferred to stable and tie up each horse in a separate stall. If that plan were adopted one horse would not be able to keep another away from its food. If the horses were expected to work well their stables should be kept quite clean, that would prevent their getting puffy legs. A bed of straw for the horses to sleep on was also advised. During the busy seasons and when working constantly they should have four good feeds each day, morning, noon, after work, and final feed of long hay at night. When feeding corn it should only be given in moderate quantities, as it overheated the blood and caused many animals to suffer from sore shoulders. When the opportunity occurred, such as on Sundays and off days, the horses would relish a roll and a run out in the paddock. Suitable provision should be made to see that the horses were always furnished with a good supply of fresh water. A piece of rock salt to lick or Epsom salts sprinkled over the feed once a week would go a long way to ward off some of the many ailments to which they were subject. He preferred a leather lined collar, as it could be kept quite clean, and the horses seemed to work more comfortably. When the horses were being fed in the middle of the day, the collars should be removed to enable them to have their meal without being worried by the collar constantly slipping down on to the ears. Before commencing work the horses should be groomed and the shoulders thoroughly brushed to prevent the collar chafing and forming sores.

CLARE, November 22nd.—The Veterinary Lecturer (Mr. F. E. Place) gave a lecture and demonstration dealing with "The Cow and Her Ailments."

TWO WELLS, November 1st.—**Homestead Meeting.**—The meeting was held at the residence of Mr. A Pratt. Members inspected the fruit garden, farm buildings, and machinery. Special interest was taken in several experimental plots of wheat sown with various quantities of manures.

WATERVALE, October 29th.—A discussion took place on various topics of local interest.

YORKE PENINSULA DISTRICT.

(TO BUTE.)

BRENTWOOD.

September 27th.—Present: 13 members and two visitors.

Breaking in a Heifer and Rearing Her Calf.—A paper was read by Mr. J. Alderman, who considered the best age for a heifer to have her first calf was at 2½ years. The calf should be taken from its mother on about the third day, and the heifer treated with all kindness. Before starting to milk her it was a good plan to gently rub the udder and teats with lard. Milking should be commenced by a gentle downward pull on the near front and off hind teats, the other two following. The mother could then be turned out with the other cattle provided the calf was out of its sight. If the cow proved very rough he strongly advocated the use of a bail. If the milker's head was pushed into the lower part of her flank it would prevent her getting her leg forward. The calf, when taken from its mother, should be left for 24 hours without being fed, and then induced to drink by putting one's finger between its lips, and pushing the head down into a bucket in which there was a small quantity of milk. For the first few days the calf should be given fresh milk, which could be gradually weakened with skimmed milk as the calf grew. Mr. Honner thought the calf should be taken from the mother as soon as possible. He was not in favor of the use of the bail, but favored a plough line tied round the horns. Mr. F. Nation thought 3½ years the most suitable age for a cow to have her first calf. Mr. F. Babbage deprecated the system many people had of allowing young heifers to run with the bull.

BRENTWOOD.

October 25th.—Present: 14 members and four visitors.

Dairying as a Sideline.—In a paper under this title Mr. F. Babbage expressed a preference for the Holstein and Shorthorn type of cattle because they were good milkers, and would bring a good price if sold to the butcher as fat stock. To obtain the best results the cows should be milked at regular intervals. He believed in milking with the teats moist, commencing with the two front teats, as that helped to preserve the formation of the udder. Separating should be done as soon as milking was finished, and the churning done three times a fortnight during the winter, and twice a week in summer. It was not a good plan to churn cream until it was two days old. For the protection of the cows shelter should be provided in the paddocks, and if there was no timber a shed could be erected. Two small paddocks, say of five or six acres each, close to the homestead, could be sown with Cape barley directly after the first rains, and fed off alternately. Chaff and crushed oats could be used if dry feeding were necessary. By mixing pollard with the separated milk and feeding to pigs they could be quickly fattened and sent to market. Mr. F. Nation thought the cows would give the milk down better if milked diagonally. Mr. J. J. Honner said the main thing was to feed well and milk at regular intervals. He cited a case in which he had recently sold a cow that was averaging 17½lbs. of butter a week, and after a short time the buyer informed him the cow would only make 12lbs. a week. On inquiry he had elicited the fact that the cow was sometimes milked at 10 o'clock in the morning and again at 5 in the afternoon, and sometimes missed a milking altogether. Mr. J. Alderman spoke in favor of diagonal milking, because there was more room for the hands, and one could milk more quickly. He strongly favored oats for milk production. Mr. C. Newbold agreed about the Shorthorn and Holstein being the best breeds for that district. He had experimented feeding both with oats and bran, and had

found oats superior. In replying Mr. Babbage said if milked as he had advocated the udder became well shaped. He had noticed cases in which the udders rose up higher in front on account of the haphazard manner in which the cows were milked.

MOONTA (Average annual rainfall, 15.22in.).

October 27th.—Present: seven members.

Water Storage.—Mr. W. F. Ortloff, in a short paper dealing with this question, urged members not to allow their dams and tanks to go to ruin because they were able to obtain a supply of water from Beetaloo. In discussing the paper, Mr. W. B. Stacey said water storage was very essential, and thought farmers should take more care of their dams and tanks. Messrs. Atkinson and Turner also spoke and agreed with the views expressed by the speaker.

WESTERN DISTRICT

BUTLER (Average annual rainfall, 16.61in.).

October 29th.—Present: 17 members and five visitors.

Mr. S. L. Butler initiated a discussion on "Making Barns and Stacks Vermin Proof." He recommended a ring fence of plain iron 1ft. in the ground and 3ft. high to protect the haystack. Mr. A. Hughes said that if bags were soaked in a solution of alum the mice would not touch them. Mr. P. G. Phillis suggested the use of sheep dip for the same purpose. In discussing the question of "Sheep-dipping," Mr. S. M. Bawden suggested the building of a sheep dip on the co-operative system.

EDILLILIE.

October 27th.—Present: seven members and one visitor.

Co-operation.—Mr. J. McMurtrie contributed a paper, in the course of which he urged the importance of co-operation to the primary producer. An association, to be of service to the farmer, he said, should return to him interest on money invested therein, a bonus on the amount of goods purchased, and a rebate on commissions charged for the disposal of his produce. The writer of the paper then dealt with the success of a co-operation venture in New Zealand. A good discussion followed, in the course of which Messrs. P. L. Crawford, T. B. Turner, and J. Olsen expressed agreement with the opinions enumerated in the paper.

GOODE (Average annual rainfall, 12in. to 13in.).

October 31st.—Present: 13 members and five visitors.

Question Box.—In reply to a question as to whether it would help fallowing to burn the grass and then lightly cultivate land, Mr. L. Will thought such a plan would be advisable, as it would not only lighten fallowing, but would more readily start the weeds, and that second ploughing would kill most of them. "Would it pay to breed horses in that district?" A member replied that only first-class draught horses should be bred, and those only as a side line. "The best type of horses for buggy work?" Mr. E. W. Watson spoke in favor of the American standard trotter. Mr. W. G. Morcombe thought a blood mare mated to a trotting stallion would give a good buggy horse.

MINNIPA.

November 3rd.—Present: nine members and seven visitors.

The Most Economical Method of Working a Scrub Block.—Mr. G. V. Lindquist, in a paper under this title, said the homestead should be built on a high piece of ground near the centre of the holding, providing good water catchments were available. If that were done, one would always be able to keep an eye on the stock. A good stable and chaff and implement sheds should be built. Side lines, such as the production of milk, butter, and eggs should be undertaken, and also small fruit and vegetable gardens planted for the use of the homestead. He thought that the log roller and axe were the best methods of clearing land for the ordinary farmer. Land should not be cropped more than three years in succession, when it could be given a spell, and then fallowed and cropped the following year. If that method were adopted much would be done to keep the land in good condition. He advised the use of 50lbs. to 100lbs. of super. per acre as being most suitable for the class of land in that district. He advocated the use of the harvester, because by that means it was possible for one to save the chaff if it was desired. Sufficient food for the stock should be kept. It was a good plan to cut a small stack of straw for use during bad seasons. At the previous meeting of the Branch Mr. Turley, in the course of a paper on "Growing Lucerne," said the land most suitable for lucerne was a sandy loam, with a gentle slope, over a good stiff clay subsoil to hold the moisture; but on deep, dark loam the lucerne should do equally as well. The land should be fallowed if possible to a depth of 6in., or if it had a crop of barley on it the year previous to sowing lucerne it would be all the better. When the winter rains set in the ground should be well worked with a cultivator to a depth of 3in. at most, and harrowed down very fine on top. Lucerne was a plant that delighted in a firm seedbed. Immediately after a good rain, in June, the ground should be again lightly harrowed, and then sown with 15lbs. of seed per acre for irrigation purposes, and with 8lbs. of seed per acre for ordinary pasture. It should be harrowed again lightly after sowing, and if no further showers fell within 48 hours, a light rolling would be beneficial. The broadcast machine obtainable for sowing small seeds was preferable to the drill, and he recommended sowing with the hand in preference to the drill. If any shelter crop was sown it should be a very light sowing of barley. If the broadcast machine was used for sowing, it was not wise to take a wider strip than 6yds. at a time, and the machine should be set to sow half one way, and come back on the other half. Prior to sowing, 2cwts. of bonedust per acre should be drilled in. If sowing by hand, the seed should be thoroughly mixed with bonedust, and each ingredient carefully weighed. Lucerne, after it was up and making into the fourth leaf, was better without water for a period of six weeks, and although it might wither, it would not die, and would eventually make the best plant. The roots, when watered by artificial or natural means, would respond at once, and overtake lucerne which had plenty of water for the period mentioned. When in bloom, it should be cut and left as a mulch or sun protector for the young plants and roots. On no account should the first growth be fed off, as that would injure the young plant before it was established, and hinder the forming of the crowns. When irrigating the most economical and best time to water was when the young shoots were coming from the crowns. Lucerne should be cut when about one-tenth was in bloom, or, roughly, a week after watering. By doing that the young plants would soon shade the surface, thereby saving the moisture previously added. When lucerne was cut for green feed it was advisable to allow it to lie for a few hours before raking, or even 20 minutes was sufficient to allow the gas to escape. That would not be long enough if it was cut in a soft or green state, more especially so if it had been watered less than a week before. If it was intended to be stacked for hay it was advisable to have one-half in bloom when cutting, and allow it to remain from 12 hours to 60 hours before raking. In curing lucerne hay it was impossible to make a hard and fast rule as to when one should cock it, as the weather affected it so quickly. The windrow method was best for curing, providing one had nice mild weather. Very little cultivation was needed when once the plants were well forward. Should there be a few hard patches in the paddock, a dressing of stable manure could be added. During summer months it required a good quantity of water, but care should be taken to see that the land was well drained.

YEELANNA.

October 27th.—Present: 12 members and three visitors.

Question Box.—The first question to be discussed was "Is it safe to castrate old rams?" The majority of members did not think so. (2) "Best method of dealing with scrub?" All members spoke in favor of the roller, as it did a much cleaner job than the log, which had a tendency to heap the bush up. Members were unanimous in their opinions that it was a good plan to rear foals for sale.

CARROW, November 1st.—Homestead Meeting.—The first homestead meeting of the branch was held at Mr. W. Umlauff's residence, when various subjects were discussed.

COLTON, November 10th.—Mr. P. P. Kenny (delegate to the Annual Congress) delivered a report of the proceedings. Mr. Shipard brought before the meeting a mower finger that he had repaired by riveting a small piece of light steel over the broken portion.

ELBOW HILL, October 27th.—The Hon. Secretary (Mr. H. J. Wheeler) read the departmental pamphlet on "Sheep on the Farm." Mr. R. T. Mills did not think lambs could be profitably exported from that district under present circumstances. He favored Lincoln-Merino crossbred sheep. Messrs. J. Wake and T. Comley considered sheep the most profitable side line.

GREEN PATCH, October 29th.—Mr. C. T. Parker delivered a report on the happenings of the recent Congress, and members discussed the question of noxious weeds and the inspection of weighbridges. Mr. F. Gore read an extract from the *Canterbury Agricultural College Magazine* on "Feeding Calves."

KOONIBBA, October 4th.—The annual meeting of the Branch was held and the Hon. Secretary (Mr. E. O. Dahl) presented the annual report and the report of the Congress. He also took the opportunity of urging members to take more interest in the workings of the Bureau.

KOPPIO, October 30th.—Mr. J. Newell, in a paper under the heading of "Encouragement to Sheepdog Fanciers," said the increasing number of sheep being kept on various farms in the district should induce farmers to breed and train a good type of working sheepdog. After a lengthy discussion it was decided to form a committee to consider the advisability of holding sheepdog trials. A discussion also took place on the number of sheep that were infested this season with tick.

WARROW, October 27th.—The meeting took the form of a discussion on the question of co-operation.

YANINEE, October 28th.—The Manager of the Government Experimental Farm at Minnipa (Mr. L. Cook) delivered an address on "Soil Moisture and its Conservation" to a meeting of 21 members and six visitors. Mr. Cook also answered numerous questions.

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES).

McNAMARA BORE.

November 4th.—Present: nine members.

Bookkeeping for the Farmer.—The Hon. Secretary (Mr. D. Aikins) contributed a paper entitled, "A System of Bookkeeping suitable for the Farmer," in the course of which he dealt with the application of the double entry system of bookkeeping to the farmer's needs. He pointed out that among the many advantages of the system were the facts that with a minimum of effort it enabled one to determine whether one's operations were profitable, and brought under notice weak spots in management. He explained the principles of the system, and urged the wisdom of balancing the books every 12 months, the closing date being made to suit the requirements of income tax returns. The books necessary were the diary, in which a note of sales, purchases, payments, &c., should be recorded, the journal, and the ledger. Particulars as to the procedure to be adopted in opening a set of books were then given, as follows:—"To commence operations when one has not kept proper accounts it will be necessary to make a valuation of all assets, land, stock, plant, &c., and perhaps of growing crops. Also the amount at credit of bank account must be ascertained, allowance being made for any cheques drawn but not presented for payment. I would strongly advise that the valuation be made on the low side. For the purpose of explanation I will value land, including improvements, at £500; stock at £200; plant at £200; growing crop, £100; credit account at bank, £50. We will first make the entries for these items in the journal. In each case we will debit the individual account, and as the total represents our capital we will credit the capital account with the various amounts. I will include with the above entries a loan of £200, which is in existence at the time the valuation is made. We will credit this item to a loan account, and as the amount is invested in land, stock, &c., we must make a debit to capital account. The journal entries are as follows:—

Date.		Name of A/c Debited.	Name of A/c Credited.	DR. £	s.	d.	CR. £	s.	d.
1917 Nov.	1	Land A/c Dr.	Valuation	500					
			Capital A/c				500		
		Stock A/c Dr.	Valuation	200					
			Capital A/c				200		
		Plant A/c Dr.	Valuation	200					
			Capital A/c				200		
		Crop A/c Dr.	Valuation	100					
			Capital A/c				100		
		Bank A/c Dr.		50					
			Capital A/c				50		
			Loan A/c Adv. to Settlers' Bd.				200		
		Capital A/c Dr.		200					
			£	1,250			1,250		

It will be noted that the totals on each side of the journal are the same; this must always be the case. We will now make these entries in the ledger:—

DR. Date.		Entry.	Amount. £	s.	d.	Date.	Entry.	CR. Amount. £	s.	d.
		Land A/c.								
Nov.	1	To Valuation	500							
		Stock A/c.								
Nov.	1	To Valuation	200							
		Plant A/c.								
Nov.	1	To Valuation	200							
		Crop A/c.								
Nov.	1	To Valuation	100							
		Bank A/c.								
Nov.	1	To Bk. of Adelaide	50							

Loan A/c.

Dr. Date.		Entry.	Amount. £	s.	d.	Date		Entry.	Cr. Amount. £	s.	d.
						Nov.	1	By Advances to Settlers' Bd.	200		

Capital A/c.

Dr. Date.		Entry.	Amount. £	s.	d.	Date		Entry.	Cr. Amount. £	s.	d.
Nov.	1	To Loan A/c Adv. to Settlers' Bd.	200			Nov.	1	By Land Valuation	500		
								Stock “	200		
								Plant “	200		
								Crop “	100		
								Bk. of Adelaide	50		

An account must be opened in the ledger for every account that is mentioned in the journal. In all cases we debit the receiver and credit the giver. Debits are always assigned to the left of the page and credits to the right. Having completed our valuations and opened up our books we will go on with our other accounts. We will suppose that our diary shows the following accounts paid when they come due, and that these entries complete the period at which we propose to make up our balance-sheet and profit and loss statement. These accounts are:—Store account, £5, paid by sale of produce, £2, and cheque No. 1, £3; wages, £5, paid by cheque No. 2; sundry accounts, £1; travelling expenses by cheque No. 3; interest on loan, £5, by cheque No. 4; sold a horse for cash, £20, and paid amount to bank; sale of wheat, £150, paid to bank. The first procedure is to enter these in the journal. The entries are as follow:—

			£	s.	d.	£	s.	d.
Dec.	31	Store A/c—Dr.	5					
		To Produce A/c, Sale of Eggs				2		
		“ Bank—Chq. No. 1				3		
		Wages A/c—Dr. a/c J. Jones	5					
		To Bank—Chq. No. 2				5		
		Sundries A/c—Travelling Expns., Dr.	1					
		To Bank A/c, Chq. No. 3				1		
		Interest A/c—Adv. to Settlers' Board, Dr	5					
		To Bank A/c, Chq. No. 4				5		
		Stock A/c—Sale of Horse, Cr.				20		
		To Bank	20					
		Crop A/c—Sale of Wheat, Cr.				150		
		To Bank	150					

We will now show ledger entries for above—

Produce A/c.

Date		Entry	£	s.	d.	Date		Entry	£	s.	d.
						Dec.	31	By Sale of Eggs...	2		

Store A/c.

Date		Entry	£	s.	d.	Date		Entry	£	s.	d.
Dec.	31	To H. S. Coombe .	5			Dec.	31				

Wages A/c.

Date		Entry	£	s.	d.	Date		Entry	£	s.	d.
Dec.	31	To J. Jones	5								

Stock A/c.

			£	s.	d.				£	s.	d.
Nov.	1	To Valuation	200			Dec.	31	By Sale of Horse .	20		

Sundries A/c.

Dec.	31	To Travelling Exps.	1								

Crop A/c.

Nov.	1	To Valuation	100			Dec.	31	By Sale of Wheat .	150		

Interest A/c.

Dec.	31	To Adv. to Settlers' Board	5								

Bank A/c.

Nov.	1	To Bk. of Adelaide	50			Dec.	31	By Chq. No. 1	3		
Dec.	31	To Sale of Horse .	20					" No. 2 ...	5		
		To Sale of Wheat .	150					" No. 3 ...	1		
								" No. 4 ...	5		

As I have already stated each ledger account would have a page or series of pages to itself. These entries completing the transaction for the period supposed to be under review, we will get on with our balance-sheet and statement of profit and loss. We must commence this by ruling off our ledger accounts in the following manner:—

Land A/c.

Nov.	1.	To Valuation	£500	Dec. 31.	By Balance	£500
Dec.	31.	To Balance	£500			

Stock A/c.

Nov.	1.	To Valuation	£200	Dec. 31.	By Sale of horse	£20
				31.	Balance	180
			£200			£200
Dec.	31.	To Balance	£180			

Plant A/c.

Nov.	1.	To Valuation	£200	Dec. 31.	By Balance	£200
Dec.	31.	To Balance	£200			

Crop A/c.

Nov.	1.	To Valuation	£100	Dec. 31.	By Sale of wheat	£150
Dec.	31.	Profit and Loss A/c ..	50			
			£150			£150

Bank A/c.

Nov. 1.	To Bank of Adelaide	£50	Dec. 31.	By Chq. No. 1	£3
Dec. 31.	Sale of horse	£20		" 2	5
	Sale of wheat	150		" 3	1
				" 4	5
				Balance	206
		£220			£220
Dec. 31.	To Balance	£206			

Loan A/c.

Dec. 31.	To Balance	£200	Nov. 1.	By Adv. to S. Board	£200
			Dec. 31.	By Balance	£200

Store A/c.

Dec. 31.	To H. S. Coombe	£5	Dec. 31.	By Profit and Loss A/c	£5

Produce A/c.

Dec. 31.	To Profit and Loss A/c	£2	Dec. 31.	By Sale of eggs	£2

Wages A/c.

Dec. 31.	To J. Jones	£5	Dec. 31.	By Profit and Loss A/c.	£5

Sundries A/c.

Dec. 31.	To Travelling expenses	£1	Dec. 31.	By Profit and Loss	£1

Interest A/c.

Dec. 31.	To Adv. to Settlers' Bd.	£5	Dec. 31.	By Profit and Loss	£5

We will leave our capital account open for the present as we will require to make an adjustment, the amount at credit or debit, as the case may be, of the profit and loss account. It will be noticed that in case of accounts representing assets the balance is carried forward to the next period. Losses and profits only are carried to profit and loss account. It is as well at this juncture to make a trial balance of the ledger. This is done by adding the total debit entries in all accounts together and comparing them with the total credit entries. The amounts must correspond. It will be noticed that neither balances nor transfers to profit and loss are included in the trial balance. The following are the entries in our case:—

£		£
500	Land A/c	
200	Stock A/c	20
200	Plant A/c	
100	Crop A/c	150
220	Bank A/c	14
	Loan A/c	200
5	Store A/c	
	Produce A/c	2
5	Wages A/c	
1	Sundries A/c	
5	Interest A/c	
200	Capital A/c	1,050
£1,436		£1,436

In ruling off the ledger, debit and credit side of each account must be made the same amount by adding to the lesser side the difference between the two sides.

This difference is either brought down to the opposite side of the ledger in readiness for the next year's transactions, or in the case of a receipt or revenue account is transferred to profit and loss account, being placed on the opposite side of that account. Having the trial balance by us it is a simple matter to draw up a balance-sheet from it. The left-hand side of the balance-sheet is the debit side or the list of liabilities, the right-hand side is the credit or list of assets. In the case of revenue and expenditure accounts the balances in these have been transferred to profit and loss account, so that they cannot be included in the balance-sheet. Our balance-sheet will work out as follows:—

BALANCE-SHEET.

Dr. (*Liabilities*).	£	*Cr.* (*Assets*).	£
Loan A/c	200	Land A/c	500
Capital	850	Stock A/c	180
Balance (profit)	36	Plant A/c	200
		Bank	206
	£1,086		£1,086

Of course, if the total assets were lower than the total liabilities the balance would be loss. The profit and loss account is as under:—

PROFIT AND LOSS A/C.

Dr. (*Losses*).	£	*Cr.* (*Profits*).	£
Store A/c	5	Produce A/c	2
Wages	5	Crop A/c	50
Sundries	1		
Interest	5		
Balance, being profit trf. to Capital A/c	36		
	£52		£52

The amount of profit being added to our capital necessitates an alteration in our capital account.

CAPITAL A/C.

Dr.	£	*Cr.*	£
Nov. 1. To Loan A/c	200	Nov. 1. By Land valuation	500
Dec. 31. Balance Fwd.	886	Stock "	200
		Plant "	200
		Crop "	100
		Bank of Adelaide	50
		Dec. 31. Trf. from Profit and Loss A/c	36
	£1,086		£1,086
		1918. Jan. 1. By Balance Fwd.	£886

There are, of course, many items with which I have not dealt that a more formal system of bookkeeping would include such as, for instance, an analysis of the store account, debiting the correct proportion to repairs, crops, &c. Another item of some importance is an allowance for depreciation. I have not had time to deal with this part of the system, and must pass over it; but would recommend all those who keep a system of accounts to make a substantial charge for depreciation at each time of drawing up a balance.

CLANFIELD (Average annual rainfall, 16in. to 17in.).

October 27th.—Present: nine members.

HAY-MAKING: FROM STANDING CROP TO COMPLETED STACK.—Mr. F. Hoffmann, in a paper on this subject, said that before going into the field the binder should be thoroughly overhauled. He preferred oats to wheat as a crop for hay and would have plenty of corn in the ear before cutting, as the horses did much better on oaten chaff when cut on the ripe side. The sheaves could be left for two or three days before stooking, and then built in long and narrow stooks, as hay would dry more quickly should rain fall, and after dunnage had been laid for the foundation, the stack could be made with round ends 5½yds. wide at the bottom and about 6½yds. at the eaves. The outside sheaf should be placed butt out and the next sheaf reversed, the heads coming a little past the band. The middle of the stack should be kept slightly higher than the edges, but the first three sheaves should be kept flat to prevent their slipping. After the walls had been built up to about 18ft., the eaves should be commenced by placing the first row of sheaves butts outwards about 6in. over the edge of the walls. If the roof were given a fairly steep slope little water would get into the stack. If possible a straw covering would further protect the stack. Another paper under the same title was contributed by Mr. J. Cockshell, who said that before commencing operations it was advisable to see that the machine was in good working order. The sheaves should be tied in the middle and the machine worked to its full capacity. Regarding the time the sheaves should be left on the ground after cutting, a great deal depended on the weather. If warm and the crop fairly ripe, it should be stacked as soon as possible, but if cooler and the crop were in good condition, the hay would be improved by allowing it to remain for about 48 hours. He preferred the round method of stacking the sheaves. The hay was ready to stack when the straw in the centre of the middle sheaves would break if bent by the fingers. Good clean straw should be laid down for dunnage, as mice would not go under the stack so readily if that were used. A stack 18ft. in width would be found a convenient size for most farmers. He favored the type of stack with round ends. The best shaped and longest sheaves should form the outer layer. The middle should be raised a little by overlapping the sheaves. Except on the ends of the stack all sheaves should lie straight across the stack; that plan was better for building and would save much time when the stack came to be opened, and as the stack increased each third or fourth layer should be butted with a strong piece of wood. He did not think it was wise to have the middle too high, especially near the ends, the overlapping of the outside sheaves would naturally remedy that. Before commencing the eaves one should make the ends of the stack about 9in. higher than the sides as they were more likely to settle down. The sheaves forming the eaves should be laid 6in. out over the edges and be worked up as the row was formed. That method could be followed until there was only one sheaf length left, when a final row should be laid down heads and butts alternately. He preferred building the roof with the heads out if the stack had to go through a wet season without being covered. Good clean straw 4in. thick spread over the stack was a cheap and efficient method of covering in the roof.

KINGSTON-ON-MURRAY.

October 4th.—Present: seven members and one visitor.

Weeds.—Mr. H. F. Holmes, in a paper dealing with this subject, said the prevalence of weeds on some of the blocks was very noticeable. He thought that in most cases they were left as a cover crop to prevent drift. He suggested that rather than have the block overrun with weeds the drifting area should be deeply ploughed in May and oats planted between the rows of trees, and in the vines a strip wide enough to enable a one-horse cultivator to work. That plan would serve two purposes, in that it would provide sufficient fodder for the stock. The plan of allowing weeds to grow to be turned in for manure when ploughing was one which he questioned. Another point to be considered was the fact that the dirty block was invariably a harbor for pests of almost every description. He believed that early ploughing would to a large extent be an effective way in which to cope with the cut-worm. Weeds also took from the soil a great amount of moisture that otherwise would have benefited the trees, &c.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

October 27th.—Present: 16 members and five visitors.

Road-making.—Mr. P. Heinicke, in a paper on this subject, said a main road should be 18ft. wide with a 9in. crown, and made by putting down 4in. bluestone or quartz 4in. thick. Five inches of limestone should then follow, and after being rolled for two or three hours, a dressing of pipeclay or good earth could be put on and rolled for at least one day. He considered 15ft. wide enough for a district road with an 8in. crown. Forming should be made to a uniform depth and 10in. of limestone put down, the lower portion of which should be lightly spalled and the top broken to 2½in. gauge.

MYPOLONGA.

October 3rd.

Ensilage.—Under this title a paper was read by Mr. G. E. Lane. He said that maize ensilage was the most palatable and nutritious food-stuff one could have for the feeding of dairy cattle, and that it was of assistance in preventing bloat. The character of ensilage largely depended upon the class of crops used, the type of silo, and the method of filling. The principles governing the manufacture of ensilage were very simple. Land that was to carry the crop should be ploughed to a depth of from 5in. to 9in., and a good tilth secured by disking, rolling, and harrowing. About 28lbs. of seed should be sown to the acre. Two acres would more than fill a 75-ton silo. The seed could be sown with a grain drill about 2ft. 4in. between the rows and 6in. apart in the rows. Experiments had indicated that two crops could be grown between the months of September and April. The crop would be ready for cutting in about 95 days from date of sowing, provided that the cob was full, firm, and glazed. The maize could be cut with a maize reaper and binder; that method was much more satisfactory than the grass cutter. All crops should be chaffed to a length of about ½in. One of the principal features of success in filling the silo was to see that the chaffed crop was carefully packed towards the outer edge of the silo. Another important factor was that all air should be excluded as the filling progressed. That could be done by treading down the surface of the ensilage. A few days spell, in which to allow the surface to settle, would not do any harm. The silo should not have too large a surface area, and should be built within a convenient distance of the cow bails. A silo with a holding capacity of about 75 tons would need to be 28ft. high and 14ft. in diameter, and would require 56 cub. yds. of stone, 23 cub. yds. of sand, and 150bush. of lime. That building when constructed would contain about 140 super. yards of 14in. stone work, labor for which would cost £21. It was a good plan when building to use about 15 courses of barb wire well twisted throughout the walls. The floor would take about 3 cubic yards of lime concrete. The inside surface of the walls should be covered with cement compo. The roof could be composed of a lean-to of pine rails, firmly secured to the walls by holding down ties, and then thatched with sheaved maize. He was not in favor of the pit silo, because of the difficulty in emptying it.

NETHERTON.

November 16th.—Present: 13 members.

Mr. J. Ball contributed a short paper, in which he pointed out that it was a mistake for farmers to rely solely on wheat-growing as a means of livelihood. Each settler should endeavor to keep a few sheep on the farm, for besides providing the household with a fresh supply of good meat, the wool and lambs were a valuable source of revenue. Mr. J. Ball stated in October, 1916, his small flock consisted of 18 ewes, 12 hoggets, and 17 lambs. The ensuing 12 months had shown an increase of 36 lambs. Last year's clip from 47 ewes and lambs, at 1s. 3d. per lb., brought in £16, and those killed £24 6s; the increase in lambs, £18. The figures showed a profit of £58 6s. for the year.

RAMCO.

October 29th.—Present: 16 members.

Methods of Trellising Vines.—Mr. G. Jackman, in a short paper under this heading, said that in many vineyards the posts used for trellising were too small and were placed too far apart. The posts should also be sunk well into the ground, and the bottom wire should be placed sufficiently high to keep the fruit from touching the ground. When laying out a set of trellisses, care should be taken to observe the following points:—The strainer posts should be not less than 12in. thick at the bottom and 9in. on top, split strainers would do for gordos. For sultanas and currants, in sandy soil, all strainers should be 4ft. in the ground, and other posts 2ft. For gordo strainers 3ft. deep, and other posts 18in. was sufficient. The bottom wire should be 1ft. 8in. from the ground, and the top wire 4ft. and the middle wire 2ft. 10in., making a distance of 14in. between each wire. Steel wire should be used. It was a good plan to have wire strainers on one end of each strainer post. He believed in having two wires for gordos and three for sultanas and currants. All posts should not be farther than 30ft. apart. A good plan was to lean the strainer post back, say about 6in. A large flat stone should be placed in the ground against the strut, which should not be more than 18in. from the ground. In the discussion that followed, Mr. F. G. Rogers thought that two wires were not needed for gordos. Messrs. Lewis and Darling agreed with the previous speaker. Mr. Stanley agreed with the writer, and favored the extra wire. He had half of his gordos on two wires, and the crop had been doubled. Mr. Lewis considered the anchor wire to be of equal value to the strut, provided it was put in correctly and in the right place. Mr. Burton thought the strut should be placed nearer to the top of the post. Mr. Stanley considered the strut should be 5ft. long and placed low down on the post. From practical experiences, Mr. Bohm said the struts placed low down on the post would give good results. Messrs. F. Lewis and F. G. Rogers gave a report of the Congress meetings.

BERRI, October 31st.—Mr. C. G. Savage (Government Orchardist) delivered an address on "Experimental work now being carried out at Blackwood."

KI KI, November 3rd.—Mr. L. H. Angus addressed the meeting on "The Points of the Horse." Members in the discussion that followed did not think a horse should be condemned if he had a few faulty points, provided he was a good worker. The Hon. Secretary (Mr. L. C. Crouch) thought every farmer should endeavor to breed his horses from the best animals.

PARRAKIE, November 24th.—The meeting took the form of a discussion on the question of "Takeall."

POMPOOTA, October 3rd.—The Government Veterinary Lecturer (Mr. F. E. Place) addressed the meeting on "The Rearing of Young Stock and Diseases Incidental Thereto." On October 17 the Poultry Expert (Mr. D. F. Laurie) gave a lecture on "Poultry."

POMPOOTA, November 7th.—The Government Veterinary Lecturer (Mr. F. E. Place) gave a demonstration and lecture on "Castration and Control of Colts." The meeting on November 14th took the form of a "Question Box" evening, when members discussed various veterinary topics.

SOUTH AND HILLS DISTRICT.

BLACKHEATH.

October 27th.—Present: 10 members and three visitors.

Power on the Farm.—Mr. W. G. Pym contributed a short paper in which he dealt with the numerous ways of working various implements on the farm. Mr. H. G. Pym also read an extract from the *Journal* on "The Destruction of Bracken Fern."

BLACKWOOD (Average annual rainfall, 27in. to 29in.).

October 16th.—Present: 15 members.

Vegetable-growing.—In a paper dealing with this subject Mr. J. Turner said that provided vegetables were planted at the correct seasons a regular supply could be obtained. Even though that district was chiefly devoted to the growing of fruit a sufficient quantity for home consumption should be grown. While the trees were small, vegetables could be planted between the rows and the extra working of the soil and manure required for their production would also assist the trees. As the trees increased in size and began to bear fruit it was not wise to follow that plan, as the vegetables would interfere with spraying operations and the picking of the fruit. He thought Pink Eye the best variety of potatoes to plant, as it seemed to be less liable to disease than other sorts. If possible, seed should be procured from a crop that had not been allowed to ripen in the ground, and planted 3in. deep in rows 2ft. 6in., about 1ft. apart. They should then be harrowed, and then hoed when about 3in. or 4in. high. Cabbages should be sown in rows and about 2ft. apart; cauliflowers 3ft. 6in. by 3ft. It was a mistake to plant these vegetables too close together, because that tended to stunt the growth. He had obtained excellent results by planting cabbages on a patch of land that had previously been cropped with potatoes. A sheltered position should be selected for planting French beans and the plants should be well watered. William Hurst and Yorkshire Hero were good varieties of peas for early and late sowing.

Sweet Potatoes.—Mr. A. K. Ashby, in a paper dealing with this vegetable, said the sweet potato was a vegetable native of tropical countries, such as China and Malay. The roots when boiled were not very appetising, but when baked with a joint of meat they made a very palatable dish, somewhat resembling vegetable marrow. It could be easily cultivated and was very prolific. The young shoots should be laid down during the spring, and lightly covered with earth, and if followed by rain they would soon commence to grow. Good rich soil and plenty of water were essential for the successful growing of the sweet potato. To produce young plants the tuber should be planted in a flower pot, filled with loamy soil, and partly buried in a heap of fresh stable manure, which should be covered with glass and be well watered. As the shoots come up they should be broken off and struck as cuttings on a hot bed, when they would readily take root and could then be transplanted and set about 3ft. apart. In ordinary seasons the plants should be struck about September and planted out in October into well prepared beds within easy distance of water.

CHERRY GARDENS (Average annual rainfall, 35.03in.).

October 30th.—Present: 13 members and one visitor.

Mr. C. Lewis gave a practical demonstration of grafting and budding fruit trees. In the discussion that followed, Mr. J. K. Ferris said any parts when cut by a saw should be smoothed off, as that would enable the bark to grow better. Mr. Stone favored "budding" as a more simple way of obtaining the desired variety of tree. Messrs. Ricks and Strange also favored "budding," because the "grafts" were often blown off by the wind.

CLARENDON (Average annual rainfall, 33.67in.).

November 5th.—Present: 20 members.

Vine-growing.—Under this title a short paper was read by Mr. C. C. Spencer, who considered the district most suitable for the production of wine grapes. He favored Doradillo, Pedro, or some other early type of grape. The land should be ploughed twice before planting, to enable one to commence by the middle of July. The holes could be dug 10in., and the cutting dropped in. He thought 9ft. one way and 4ft. 6in. the other a fair distance apart to plant the cuttings. An opportunity was also taken by Mr. Phelps of presenting to Messrs. A. Harper and J. Spencer certificates entitling those members to life membership of the Agricultural Bureau after an active membership of 21 years. Messrs. Potter and Brooks reported on the recent Congress.

HARTLEY (Average annual rainfall, 15in. to 16in.).

October 24th.—Present: 11 members.

Economy on the Farm.—Mr. A. Stein contributed a paper on this subject, in which he pointed out the necessity for having a blacksmith shop on the farm. Considerable time would be saved if one had a forge where breakages could be repaired and odd jobs, such as making eye bolts, sharpening plough and cultivator shares and hooks, carried out. With care and practice one would also be able to shoe the horses. Old fencing wire should not be left lying about in the paddocks, where it would very likely cause injury to live stock, but should be rolled up and stored in a safe place. The time would come when such wire could be used.

LONGWOOD (Average annual rainfall, 37in to 38in.).

October 27th.—Present: 12 members and 10 visitors.

Homestead Meeting.—The meeting was held at Mr. W. Nicholl's residence. An inspection was made of the poultry yards and appliances, all of which had been manufactured by Mr. Nicholls. The houses were made of reinforced concrete 9ft. by 9ft. by 4ft. 6in. with back 3ft. 6in. and walls 2in. thick. From a home-made incubator he had hatched 46 chicks out of a possible 47. Mr. W. H. Hughes, on behalf of the Longwood Branch of the Agricultural Bureau, presented Messrs. J. Roebuck and W. Nicholls with framed life membership certificates. Mr. Hughes, in the course of his remarks, referred in eulogistic terms to the services these two gentlemen had rendered the Bureau since their initiation as members in 1894.

LONGWOOD (Average annual rainfall), 37in. to 38in.).

November 24th.—Present: 13 members and two visitors.

Homestead Meeting.—The monthly meeting of the Branch was held at Mr. J. H. Brown's residence. Mr. C. Morgan (Iron Bank), in a paper on "Strawberry Culture," said to obtain best results for early varieties one should choose a piece of ground facing the north, with an incline to the west, and for later sorts it should be facing south. The ground should be ploughed or grubbed to at least 18in. deep. He preferred grubbing, because the earth was mixed much better. The lumps on the surface should then be broken down to a fine tilth. The next step was to sow a dressing of bonedust, say, a ton or 30cwt. to the acre, and commence planting about June, to enable the plants to get a good start before the weather became too hot. They should be planted 2ft. between the rows, and 15in. to 18in. apart. The soil should be hoed two or three times before the summer set in, and when the bushes were two years old a dressing of bonedust should be dug in. That practice should be followed once every following year. Of the early varieties he favored the Gandy, and for later crops the Sunbeam. If the fruit was lightly sprinkled with sulphur once or twice before it ripened it would prevent mildew. On no account should the fruit be handled more than necessary.—Mr. Hughes spoke of the value of skim milk for fattening pigs. He had recently tried an experiment with two Yorkshires. The animals at seven weeks old weighed respectively 28lbs. and 29lbs., and after being fed three times a day on pollard and warm separator milk for 13 weeks they weighed 142lbs. and 134lbs. when killed.—Mr. Beythein also gave a short discourse on "Poultry."

MILANG.

November 10th.—Present: 37 members.

Farm Management.—Mr. J. McCheriton read a paper dealing with the management of the farm. Taking the growing of cereals as the first topic for discussion he said one should endeavor to keep the fallowed land clear of rubbish either by cultivation or by running a flock of sheep on it, because they were good scavengers, and would also add fertility to the soil. All seed should be graded and pickled in bluestone or formalin before drilling. Whatever methods were adopted he advised the keeping of a record of the various undertakings. It should be the aim of every farmer to breed horses for the successful working of his farm. He favored active horses, because they were able to do a good day's work. Care should be taken of the mares when in foal. It was important that when being weaned the foals should be well looked after or they would never develop into good horses. A few good cows if well looked after would help in the upkeep of the farm. In dealing with the question of sheep Mr. McCheriton did not think any farm complete without a small flock of sheep. He considered that if ordinary care was taken of the ewes, such as providing them with a good supply of water during the hot weather, and tending them during lambing season, that would prove one of the most valuable sidelines on the farm. Pigs and poultry could be made, with very little trouble, to help in the expenditure necessary for the upkeep of the farm. Each machine, when finished its allotted work for the season, should be thoroughly overhauled, and any repairs effected, then stored in the shed, and not left out at the mercy of the weather, as was too often noticeable on many farms. The writer also dealt with the subjects of "Farm Bookkeeping," "Afforestation," and "Noxious Weeds."

MYPONGA.

November 1st.—Present: six members and two visitors.

The Cow.—Under this title a paper was read by the Hon. Secretary (Mr. J. J. Muller) who said that before buying the cattle with which to breed up the herd one should study the conditions of the district. He was convinced that the Jersey was the best milk and butter producing cow one could go in for. There were several points on a cow that indicated quality. A good deep body, wide at the hips and narrow at the wither, small neck, the head clean and tapered, wide between the eyes, which should be clear and prominent. The legs should be clean and shapely, back straight, tail thin, skin soft to the touch, and yellow in color. Milk veins should be prominent, and the further they ran along the belly the better. The escutcheon should be wide, and be carried well on to the udder, which should be wide and not too deep, and extend beyond the hind legs. The teats should be well set on the udder and not bottle-shaped, as they were generally tough milkers. He was always particular to see that the teats were large enough to enable one to milk full-handed. To obtain good milk results it was essential that good feed, such as bran and chaff, in addition to green feed should be given to the cow. He had found it a good plan to give each cow a pinch of bonemeal each day, that prevented them from chewing bones.

URAIDLA AND SUMMERTOWN (Average annual rainfall, 44.35in.).

November 5th.—Present: 19 members.

INTENSE CULTIVATION OF THE POTATO.—"The land in that district," said Mr. Cobbledick, in a paper on this subject, was especially well adapted to the cultivation of the potato. Assuming that one had sufficient land, a good plan was to plant at least three varieties, say, Pinkeye, Carmen, and Up-to-Date. They could be planted in the order mentioned, and completed, if possible, by the end of October or middle of November. A great deal depended upon the selection of the seed, and unless prices were too high, he favored purchasing Victorian seed. Pinkeyes of a good shape and medium size should be selected. Practically the same applied to the two other varieties mentioned. The next step was cultivation, and that should be done in August to a depth of at least 10in. The ground should be then harrowed and left until a fortnight before planting, when it should again be ploughed, and if the weather permitted, worked down to a fine tilth. When stable manure was available he would use it at the rate of 40 tons to the acre, spread before the first ploughing, preferably in wet weather. If no stable manure was available he would use bonedust at the rate of 25 tons to the acre. The land should be ploughed at rows to a depth of 8in., and the potatoes planted 3in. from the bottom to allow for drainage in case of wet weather. They could be planted 22in. between the rows and 15in. in the row. When the seed was ploughed in the land could be worked down to a fine tilth by using the roller and harrows. After about three weeks the land should again be harrowed to kill any weeds, and to break the crust on the surface of the ground. When the plants were well up in the rows they should be gone through with the horse hoe and the plants hoed between by hand. As soon as they were banked up preparation should be made for watering, and for that purpose he thought sprinklers should be used and the ground kept damp.

CYGNET RIVER, October 25th.—A paper on "Co-operation" was contributed by Mr. C. T. Miller, in which he said that great benefits would be derived from the formation of a co-operative society that would handle their produce. He suggested that the wheat harvest should be handled by a co-operative body, in a manner similar to that proposed for New South Wales. Members generally indorsed the views expressed in the paper.

INMAN VALLEY, October 25th.—The delegates to the recent Congress delivered their report, and members discussed the various papers.

MACGILLIVRAY, October 30th.—Mr. R. Wheaton gave a detailed account of a visit to the Government Experimental Farm at Kybybolite, and the districts of Lameroo and Pinnaroo.

MEADOWS, October 31st.—The Chairman (Mr. G. Ellis) read a paper from the *Journal* dealing with "Sugar Beet." Mr. Wade believed sugar beet could be profitably grown for stock feed, but not from the sugar industry point of view. He preferred the beet to mangolds as a fodder, and advocated a top dressing of artificial manure after the plants were up.

MORPHETT VALE, November 3rd.—Mr. E. Perry tabled samples of wheat, the flags of which were affected by red rust; a general discussion followed.

PORT ELLIOT, October 20th.—Mr. W. E. Hargreaves read a paper on "Repatriation," which was well discussed. Mr. H. L. Smith recommended the growth of clover as a means of checking the development of sorrel. The application of seaweed to stiff land was recommended, but it was not advisable to apply seaweed to sandy land.

URAIDLA AND SUMMERTOWN, October 1st.—Mr. Beythein (Glenholm Egg Farm) attended the meeting and delivered an address on "Poultry-keeping."

SOUTH-EAST DISTRICT.

KONGORONG.

October 23rd.—Present: eight members and one visitor.

THRASHING.—Mr. E. E. Morrison, in reading a paper on this subject, compared the methods of harvesting wheat in Canada to those in operation in Australia. He said he was struck first of all with the many labor-saving devices they had, and also with the number of men needed to harvest the crop. With a machine that would handle from 1,000bush. to 1,500bush. in a day in Australia about 20 men would be needed, whilst in Canada only 10 men would be required to clean the same quantity of wheat.

SANDALWOOD.

November 6th.—Present: 12 members.

FARM MACHINERY.—Mr. H. J. Page, in dealing with this question, spoke in favor of the stripper and winnower. Although he considered the harvester saved a good deal of labor, the many complicated parts of the machine were very subject to wear and tear. The machine should be emptied into as few heaps as possible, to save undue shifting of the winnower. The poison cart was a useful implement to have on the farm in districts that were troubled with rabbits, and to obtain best results it should be used soon after harvest. He also spoke of the advantage to be derived if one had a fire rake with which to kill mallee shoots.

TANTANOOLA.

November 3rd.—Present: 17 members.

BREEDING DRAUGHT HORSES.—Mr. T. Smith, in a paper dealing with this subject, said care should be taken to select good sound mares. A Clydesdale mare mated with a Shire stallion should get good useful horses. In selecting the mares the following points should be observed—brightness of the eyes and the quick movement of the ears. When near foaling time, the mares should not be kept too fat, or she would probably have difficulty in foaling. In concluding, the writer urged upon members the necessity for having the services of the best stallion available.

COONAWARRA, October 30th.—Papers were contributed by Mr. J. Skinner on "Bitter Pit in Apples," and by the Hon. Secretary (Mr. H. A. Reschke) on "Wool-classing." Mr. E. F. McBain tabled a fine sample of wool from a Crossbred lamb.

KALANGADOO, October 3rd.—Mr. D. W. Tucker (Congress delegate) delivered a report of the proceedings, and an interesting discussion followed. Mr. Mitchell tabled a fine sample of "subterranean clover," which was stated to be doing well on his farm.

MUNDALLA, October 31st.—Two papers were contributed, one by Mr. R. Saxon, on "Wool-classing," the other on "Sheep Tick," by Mr. R. Wiese.

SANDALWOOD, October 6th.—Mr. T. W. Wacchow introduced a discussion on "Haymaking," in which he pointed out the necessity for sowing early varieties of wheat that one intended to cut for hay.

SHEEP NASAL FLY.

Specimens of the sheep nasal fly larvae were recently received from a correspondent in the Clare district, and handed to the Government Veterinary Lecturer (Mr. F. E. Place, B.V.Sc., M.R.C.V.S.), who reported as follows:—"The grubs are the larvae of the sheep nasal fly *Oestrus ovis*. They are regarded as scarce curiosities by many people, but during the last two years I have received specimens from districts as wide apart as the Victorian Mallee, Pinnaroo, and the Far North of this State, so one may conclude that they are widely distributed, and it is interesting to learn that the sheep under notice came from Queensland.

"I am taking the liberty of quoting and criticising your excellent observations:—'The grubs were taken out of a sheep's head after killing; the sheep (wether) was quite fat, but very crazy and wild—the usual symptoms—and the grubs had eaten holes right into the bone, and some perforated right through—not quite correct—they were in natural cavities, the sinuses of the face and horn cores.'

"The following details will answer your questions as to how long they had been there, they were of three broods, whether they arrive from outside or inside, whether they are likely to become a pest, and possible remedies and preventives.

"The fly which deposits these larvae is *Oestrus ovis,* 10-12mm. long, yellowish-grey, and slightly hairy, face yellow, and black brownish grey with faint streaks, the wings transparent and marked by three black points at their base. The fly is widespread over the world. Like all the botfly tribe, of which it is a member, it lives in its perfect state during the warm months of the year, and only flies in dry warm weather; it hides in holes and cracks, and when the weather is warm enough leaves them to mate, when it flies about in a lively way and rests on rocks. The impregnated female then goes in search of sheep, which are afraid of it, and bury their noses between their fore feet huddled together in the dust; but while they are chewing their cud she deposits her eggs on their noses, which excites them, they rush about snorting and sneezing and rubbing their noses sore.

"The larvae, which develop to 25mm., are white, the back is rounded and convex, while the ventral surface is flat, and the fourth and following segments carry red pointed spines on each side.

"The larvae remain in the nasal cavities of the sheep about 10 months, and when they are mature they detach themselves from the mucous membrane and creep about, and on account of the large openings between the cavities they pass into the nose, and the sheep sneezes and snorts them out. In this stage they are soft and red, they change to brown and black pupae, and in about six weeks develop into the perfect insect. It is usual to find three or four larvae in the frontal sinuses of a sheep that has not shown any symptoms of their being there. They rarely cause any disturbance unless they are numerous and well developed, when they reveal their presence by a discharge from the nose, at first clear, then thick and glairy, and the sheep tries by sneezing and snorting to get rid of them. The sheep will throw their heads back and shake it and rub their noses with their feet or on the ground. As the larvae grow they will lower their heads and walk with high steps and have fits, but they do not go round in a circle as in gid. Their eyes are red, run and roll, and the animals sometimes die.

"Prevention consists in Europe of keeping sheep away from scrub during the hot months and smearing their noses with fish oil and tar. They are taught to do this for themselves by having salt licks in boxes with holes about 2in. diameter smeared with tar.

"It is said that the flies will not stay where the common broom, *Cytisus scoparius,* grows as sheep are very fond of the plant; but personally I have no knowledge of its use in this direction.

"An effective method of treatment is to draw a line across the top of the two eyes and bisect it with a transverse one, and to bore a hole in each upper angle, when the grubs often creep out or can be picked out with forceps or killed by injecting a few ounces of a mixture of benzine one part, water four parts. The skin is then brought over the holes and plastered with tar and soon heals. Other people fumigate with sulphur or pour turpentine and glycerine up the nostril.

"I have not had opportunity to try the effects of gall on these grubs, but arguing from the effect it has on the stomach bots of the horse it would be worth while to try what effect a mixture of gall one part, milk six parts, either poured into the nostril or into the trephined wound, would have. But a sheep apparently cured will often show symptoms later, so that slaughter is the economic method when there is any condition about them at all.

"I am not an alarmist, and I do not anticipate their becoming a serious economic pest, but it is very advisable to kill every such grub that one comes across because like all flies they multiply rapidly, and will accustom themselves to fresh conditions."

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Monthly Notes in *The Journal of Agriculture;* subscription 1s. per annum, posted; 2s. 6d. Inter-State.

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CROWN LANDS.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portion of a block, if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey.

ALLOTMENTS, SALES, TRANSFERS, SUBLEASES, AND MORTGAGES.

Notice is hereby given that in future no applications for land, or for transfer, sublease, or mortgage of Crown leases or agreements will be approved to unnaturalised persons of *any* nationality, or to naturalised persons of enemy origin unless the consent of the Honorable the Attorney-General of the Commonwealth be first obtained by the parties making the application.

Where any doubt as to nationality exists, it will be necessary for certificate of birth or naturalisation papers to be exhibited.

The same principle will apply to land sold by auction.

OFFICIAL LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which may be seen at the principal Post Offices, and copies obtained at the Office of the Secretary for Lands. The List shows the Areas, Localities, Prices, &c., of the Sections available and the conditions under which they may be applied for.

NOTICE TO APPLICANTS FOR LAND.

The Land Board meets daily (when necessary) at the Board's Office, Department of Lands, to deal with applications received the previous day for any lands that may be open in the Official List. Applicants must either attend personally or send a full written statement. Forms can be obtained at Post Offices, or on application to the Secretary for Lands.

HARRY JACKSON,

Commissioner of Crown Lands and Immigration

AGRICULTURAL COLLEGE, ROSEWORTHY.

The seed grains submitted for sale this season comprise a number of early, mid-season, and late wheats and barleys, a mid-season variety of oats, and a small quantity of field pease. The cereals have all been selected from pure strains and well graded. The production of selected and graded seed has been continued at the College for over 12 years, and hence most of the strains now being offered possess unbroken pedigrees of considerable length.

CATALOGUE AND PRICE LIST OF SEED GRAINS AVAILABLE FOR 1918 SEEDING.

Orders will now be booked for any of the undermentioned varieties, and applications will be dealt with as far as possible in the order in which they are received. The prices quoted are "on truck, Roseworthy," and are subject to revision. All orders and inquiries should be addressed to—

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Agricultural College, Roseworthy.

GRADED PEDIGREED SEED WHEATS.

EARLY VARIETIES.

King's White	Selection 9	5/- per bushel
King's White	" 10	5/6 " "
King's Red	" 10	5/6 " "
Caliph	" 1	5/- " "
Gluyas	" 9	5/- " "
Gluyas	" 10	5/6 " "
Late Gluyas	" 9	5/- " "
College Eclipse	" 9	5/- " "

MID-SEASON VARIETIES.

Daphne	Selection 4	5/6 per bushel
Federation	" 8	5/6 " "
Queen Fan	" 6	5/- " "
Queen Fan	" 7	5/6 " "
Anvil	" 4	5/6 " "

LATE VARIETIES.

Canaan	Selection 4	5/6 per bushel
Marshall's No. 3 B	" 8	5/6 " "
Yandilla King	" 4	5/6 " "

GRADED AND PEDIGREED SEED BARLEYS.

EARLY VARIETIES.

Tunis 1	Selection 1	4/6 per bushel
Tunis 2	" 1	4/6 " "
Tunis 3	" 1	4/6 " "

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Tunis 4	Selection 1	4/6 per bushel
Tunis 5	" 1	4/6 " "
Roseworthy Oregon	" 9	4/6 " "
Roseworthy Shorthead	" 10	4/6 " "

LATE VARIETIES.

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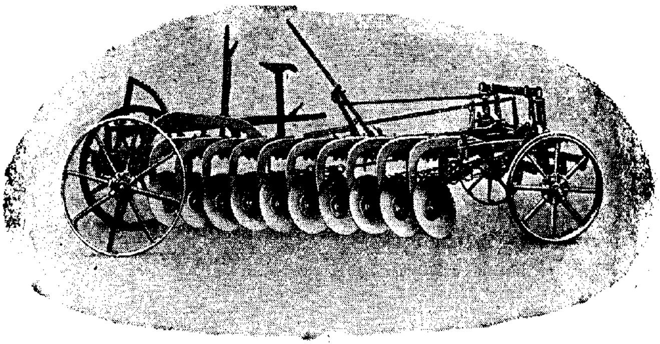

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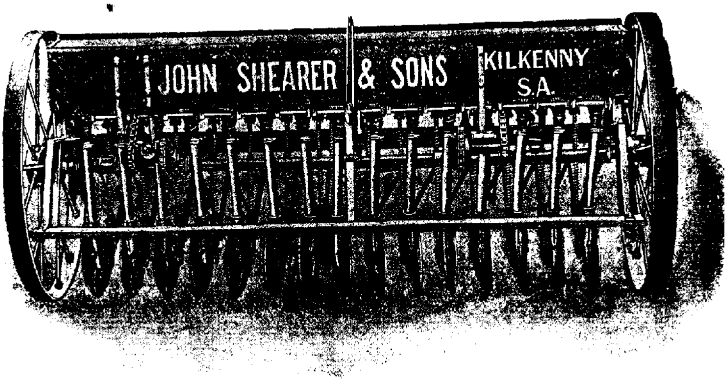

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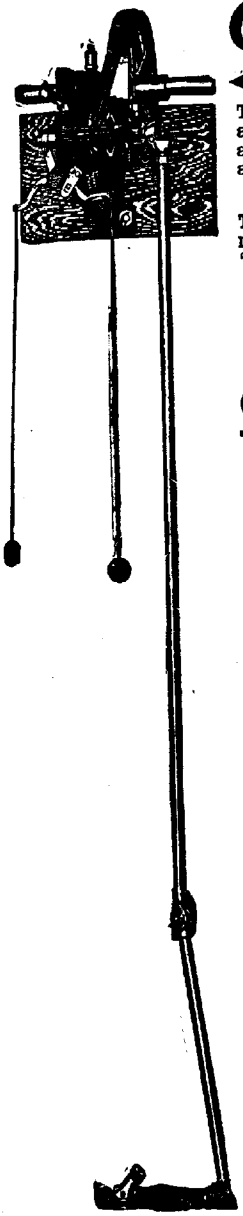

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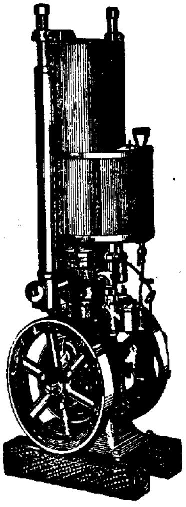

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AGRICULTURAL PUBLICATIONS.

The following publications have been issued by the Department, and are available for distribution at prices mentioned:—

"Fruit Tree and Grape Vine Pruning," by Geo. Quinn (Horticultural Instructor); price, 2s. 6d.; posted, 2s. 8d.

"Vinegrowers' Manual," by A. Sutherland; price, 6d.; posted, 7d.

Journal of the Department of Agriculture, 1s. per annum in advance; 3d. per single copy to residents of South Australia. Other places, 2s. 6d. per annum.

Any of the following bulletins and leaflets may be obtained by sending a penny stamp for postage:—

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Castration of Colts	XXIX.
Cocky Chaff and Straw as Feed for Stock	III.
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